

McElhanney Consulting Services Ltd.



## PROJECT MANUAL

# **PARKS CANADA AGENCY WESTERN AND NORTHERN REGION**

## **Rock Creek Campground and Day Use Area Phase 01**

McElhanney Project No. 2711 16012 00

Parks Canada Project No. PRO #836

**GRASSLANDS NATIONAL PARK, SK**

ISSUED FOR TENDER  
July 21, 2016

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**END OF SECTION**

**Part 1            General**

**1.1                WORK COVERED BY CONTRACT DOCUMENTS**

- .1            In preparation for and during construction of this project, the Contractor shall review the requirements of Section 01 35 43 – Environmental Procedures to ensure the desired minimal adverse effects are achieved. The Departmental Representative and Parks Canada’s Environmental Surveillance Officer (ESO) will refer to Section 01 35 43 – Environmental Procedures in determining compliance.
- .2            All requirements noted within the Contract Documents shall be completed by the Contractor unless specifically stated otherwise.
- .3            Without limiting the scope of work, the work of this Contract generally comprises the following:
  - .1            Gravel Road Construction
  - .2            Campsite Construction including but not limited to; excavation, grading, electrical and water works.
  - .3            Landscaping and Miscellaneous construction as indicated on Drawings and Specifications.

**1.2                DEFINITIONS**

- .1            Saskatchewan Government Ministry of Highways and Infrastructure is referred to as “MHI”. The MHI Standard Specification Manual can be found at the following location:
  - .1            <http://www.highways.gov.sk.ca/standard-spec/>
- .2            Changes in Definition, - The following changes in definitions have been made to the MHI Specifications:
  - .1            Engineer – The word “Engineer” shall mean the PCA Departmental Representative or his duly appointed representative unless noted otherwise.
  - .2            Grasslands National Park is referred to as “GNP”, “Park” or “The Park”.
  - .3            Any reference to “Parks Canada Agency”, “Parks Canada”, “PCA” or “The Owner”, shall refer to Parks Canada Agency and shall include any affiliate or sub group of Parks Canada.

**1.3                PROJECT LOCATION**

- .1            The project is located in Grasslands National Park (GNP). The following are key locations relative to the project:
  - .1            Rock Creek Campground and Day Use Area
  - .2            East Block McGowan’s Visitor Centre

**1.4                CONTRACT METHOD**

- .1            Construct Work under unit price contract items as noted in specification sections.

**1.5 CONSTRUCTION SCHEDULE**

- .1 The contractor is required to provide and maintain a work schedule as described in section 01 32 16 and the final completion date must be met as a requirement of this contract.

**1.6 WORK SEQUENCE**

- .1 The Contractor shall schedule work progress to allow Owner / Departmental Representative unrestricted access to inspect all phases of the Work.
- .2 The Contractor shall commence Work immediately after award of contract.
- .3 Construction site shall be closed to general public.
- .4 Coordinate Progress Schedule during construction.
- .5 Maintain fire access/control.
- .6 Obtain Substantial Completion of the Work by October 30, 2016.
- .7 Obtain Final Completion of the Work by October 30, 2017.

**1.7 SITE SUPERINTENDENT**

- .1 Prior to commencing the Work, the Contractor shall designate a Site Superintendent as outlined in Contract.
- .2 Should the Site Superintendent be deemed not qualified to perform the required duties of a Site Superintendent, the Contractor will be responsible for providing a Site Superintendent who is acceptable to the Departmental Representative. Refer to Contract.

**1.8 WORK SITE SAFETY - THIS CONTRACTOR IS "PRIME CONTRACTOR"**

- .1 The Contractor shall, for the purposes of the Occupational Health and Safety Act (Saskatchewan), and for the duration of the Work of this Contract:
  - .1 be the "prime contractor" for the "work site", and do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with the Act and its regulations, as required to ensure the health and safety of all persons at the "work site".
  - .2 The Contractor shall direct all Subcontractors, Sub-subcontractors, Other Contractors, employers, workers and any other persons at the "work site" on safety related matters, to the extent required to fulfill its "prime contractor" responsibilities pursuant to the Act, regardless of:
    - .1 whether or not any contractual relationship exists between the Contractor and any of these entities, and
    - .2 whether or not such entities have been specifically identified in this Contract.

### **1.9 CONTRACTOR USE OF PREMISES**

- .1 The Contractor is not permitted to extract and process native material for the production of granular aggregate anywhere inside GNP unless specifically directed by the Departmental Representative.
- .2 The contractor has sole use of site until Substantial Performance within project boundaries indicated at start up meeting subject to Section 01 14 00. The road into the area will be shared with visitors and Parks Canada Staff.
- .3 Maintain continued access to parking lot and public washroom facilities during construction.
- .4 Co-ordinate use of premises under direction of Departmental Representative.
- .5 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

### **1.10 CONTRACTOR ACCOMMODATIONS**

- .1 There is no work camp area located within the National Park Site. Contractor may camp with their own gear on site at locations as directed by Departmental Representative. Services may not be available for Contractor campers.
- .2 Campgrounds may be available for fee as indicated at each campground.

### **1.11 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Health and Safety Plan and Other Safety Related Documents.
  - .11 Permits
  - .12 Survey
  - .13 Other documents as specified.

### **1.12 MEASUREMENT PROCEDURES**

- .1 Contractor Use of the Site:
  - .1 Measurement: No measurement shall be made.
  - .2 Payment: The price shall include the cost of all requirements of Division 01 including but not limited to fencing, staging area, Environmental requirements

including plans, temporary facilities, erosion control measures, and all work and materials not covered elsewhere.

**Part 2            Products**

**2.1                NOT USED**

**Part 3            Execution**

**3.1                NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                INTENT**

- .1        The Work shall be designed, constructed, and commissioned in a manner which is compliant with local authorities.
- .2        The Contractor shall be required to apply for and receive all relevant permits prior to starting Work.

**1.2                ACCESS AND EGRESS**

- .1        Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial, federal, and other regulations. Maintain access during construction.

**1.3                USE OF SITE AND FACILITIES**

- .1        The Work Site specified in these specifications shall only be used for the purposes of the Work. The Work Site will be made available by the Owner to the Contractor for its non-exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents. The Contractor shall include in the tender, payment to taxes properly levied by law (Federal, Provincial and Municipal) including the cost of any collection of permits and business licenses.
- .2        Site is limited by existing buildings and access.
- .3        Execute work with least possible interference or disturbance to normal use of area. Contractor shall maintain adequate drainage and siltation control at the Worksite. Make arrangements with Departmental Representative to facilitate work as stated.
- .4        Security fencing is required to ensure public protection in accordance with OH & S guidelines. Security fencing is required around staging area.
- .5        Snow fencing (black in colour) is required at perimeter of work area as described by the drawings. Departmental Representative may request additional fencing if the limits of work are being impeded.
- .6        Closures: protect work temporarily until permanent enclosures are completed.

**1.4                HOURS OF WORK**

- .1        Work hours are between 8:00 am and 6:00 p.m., seven days a week.

**1.5                MIGRATORY BIRDS**

- .1        Sage Grouse breeding season is April 1 to mid June. Follow migratory bird requirements for work during this time.

**1.6                WORK BY OTHERS**

- .1        Co-ordinate work with that of other Contractors.

**1.7            EXISTING SERVICES**

- .1        Notify Departmental Representative and private and public utility companies one week prior to intended interruption of services and obtain required permission.
- .2        Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .3        Provide for vehicular traffic control as needed.
- .4        Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

**1.8            BUILDING SMOKING ENVIRONMENT**

- .1        Smoking is only allowed in designated areas.

**Part 2        Products**

**2.1            NOT USED**

**Part 3        Execution**

**3.1            NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                ADMINISTRATIVE**

- .1        The Contractor shall schedule and administer project meetings throughout the progress of the work as requested by the Departmental Representative including the following items;
  - .1        Prepare agenda for meetings.
  - .2        Distribute written notice of each meeting four days in advance of meeting date to all parties.
  - .3        Contractor to provide physical space and make arrangements for meetings in coordination with Departmental Representative.
  - .4        Departmental Representative to preside at meetings.
  - .5        Record the meeting minutes and include significant proceedings and decisions with identification of actions by parties.
  - .6        Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance.
- .2        Representative of Consultant, Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

**1.2                PRECONSTRUCTION MEETING**

- .1        Within 15 days after award of Contract, the Contractor shall request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2        Senior representatives of Departmental Representative, Consultants, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3        The Contractor shall establish time and location of meeting and notify parties concerned at 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 and Reporting Relationships in the Work.
  - .2        Schedule of Work: in accordance with Section 01 32 16 - Construction Progress Schedules.
  - .3        Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .4        Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
  - .5        Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
  - .6        Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  - .7        Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .8        Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.

- .9 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
- .10 Monthly progress claims, administrative procedures, photographs, hold backs.
- .11 Appointment of inspection and testing agencies or firms by Contractor.
- .12 Insurances, transcript of policies.
- .13 Review of Health and Safety Plan and appointment of Health and Safety Co-ordinator.

### **1.3 PROGRESS MEETINGS**

- .1 During course of Work and 2 weeks prior to project completion, schedule progress meetings every two weeks.
- .2 Contractor, major Subcontractors involved in Work and Departmental Representative and Owner are to be in attendance.
- .3 Notify parties minimum 7 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three (3) days after meeting.
- .5 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for affect on construction schedule and on completion date.
  - .12 Review health and safety issues.
  - .13 Review environmental issues.
  - .14 Other business.

**Part 2            Products**

**2.1                NOT USED**

**Part 3            Execution**

**3.1                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 workweeks.
- .6      Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7      Milestone: significant event in project, usually completion of major deliverable.
- .8      Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9      Project Planning, Monitoring and Control System: overall system operated by Consultant to enable monitoring of project work in relation to established milestones.

**1.2                REQUIREMENTS**

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

### **1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 The Contractor shall submit to Departmental Representative within 15 working days of Award of Contract, Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

### **1.4 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award.
  - .2 Shop Drawings, Samples.
  - .3 Permits.
  - .4 Mobilization.
  - .5 Excavation.
  - .6 Backfill.
  - .7 Siding and Roofing.
  - .8 Interior Architecture (Walls, Floors and Ceiling).
  - .9 Plumbing.
  - .10 Lighting.
  - .11 Electrical.
  - .12 Piping.
  - .13 Controls.
  - .14 Heating, Ventilating, and Air Conditioning.
  - .15 Millwork.
  - .16 Fire Systems.
  - .17 Testing and Commissioning.

### **1.5 PROJECT SCHEDULE REPORTING**

- .1 The Contractor shall update Project Schedule every two weeks 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.

### **1.6 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**

**Part 3            Execution**

**3.1                NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1            This work shall be considered incidental to contract and no payment shall be made for this item.

**1.2                ADMINISTRATIVE**

- .1            The Contractor shall submit to the Departmental Representative all submittals listed for review. The submissions shall be prompt and in orderly sequence so as to not cause a delay in Work. Failure to submit in ample time is not considered sufficient reason for an 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 and approved.
- .3            The Contractor shall review submittals prior to submission to 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.
- .4            The Contractor shall notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .5            The Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .6            The Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .7            The Contractor shall keep one reviewed copy of each submission on site.

**1.3                SAMPLES**

- .1            Submit for review samples in duplicate or as requested in respective specification Sections. Label samples with origin and intended use.
- .2            Deliver samples to Departmental Representative at bi-weekly site meetings.
- .3            Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4            Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .5            Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

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

**1.4 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, The Contractor shall submit their Workers' Compensation Board status.
- .2 The Contractor shall submit transcription of insurance immediately after award of Contract.

**1.5 REQUIRED CONTRACTOR SUBMITTALS**

- .1 General
  - .1 This Clause identifies the plans, programs, and documentation required prior to mobilization on site and during the construction phase.
- .2 Pre-Mobilization Submittals
- .3 Construction Phase Submittals
- .4 Project Completion Submittals

**Part 2 Products**

**2.1 NOT USED**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                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 humankind; or degrade environment aesthetically, culturally and/or historically.
- .2        Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

**1.2                SUBMITTALS**

- .1        Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Prior to commencing construction activities or delivery of materials to site, the Contractor shall submit an Environmental Protection Plan (EPP) for review and approval by the Departmental Representative. The Environmental Protection Plan shall present comprehensive overview of known or potential environmental issues which must be addressed during construction.
- .3        Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .4        Environmental protection plan will include:
  - .1        Names of persons responsible for ensuring adherence to Environmental Protection Plan.
  - .2        Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
  - .3        Names and qualifications of persons responsible for training site personnel.
  - .4        Descriptions of environmental protection personnel training program.
  - .5        Erosion and sediment control plan which identifies 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.
  - .6        Drawings showing 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. Plans 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. Plan to include measures for marking limits of

use areas including 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.
- .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, do not become air borne and travel off project site.
- .12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .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.
- .15 Pesticide treatment plan: to be included and updated, as required.
- .16 Include an equipment access plan.

### **1.3 FIRE PREVENTION AND CONTROL**

- .1 Carry fire extinguisher for use on each machine and at locations as required in the event of fire. Basic fire fighting equipment recommended includes three shovels, two pulaskis, and two five gallon backpack pumps) shall be maintained at the construction site at a location known and easily accessible to Contractors' staff. Contractor's staff shall receive basic training in early response to wildfire events during the "environmental briefing".
- .2 Construction equipment shall be operated in a manner and with all original manufacturer's safety devices to prevent ignition of flammable materials in the area.
- .3 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented.
- .4 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The ESO and the Departmental Representative shall be notified of any fire immediately. If not available, fire services should be contacted at 911. Closest fire station is over 30 minutes away.
- .5 Fires and burning of rubbish on site not permitted.

### **1.4 DISPOSAL OF WASTES**

- .1 All garbage must be stored and handled in conformance with the Grasslands National Park Garbage Regulations.

- .2 All surplus and waste materials shall be removed from the job site to approved sites. Disposal of all wastes shall be in compliance with the Environmental Contaminants Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
- .3 The closest construction waste site for this project is within 100 km. Contractor shall remove all demolition, construction, and trade waste from the site and dispose of materials at designated site on a regular basis or when directed by Departmental Representative. All users and vehicles must report to the transfer scales prior to the disposal of any material. Various rate schedules apply for unsorted waste, scrap metal, asphalt shingles, appliances, and painted wood.
- .4 No food, domestic garbage or hazardous wastes may be deposited in the trade waste site. Obtain bear proof garbage containers on-site for domestic garbage generated on-site by Contractor's personnel.
- .5 Dispose of all hazardous wastes in conformance with the Environmental Contaminants Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
- .6 Maintain the site in a tidy condition, free from the accumulation of waste products, debris and litter.
- .7 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .8 No separate payment will be made for waste disposal. Costs of this work shall be considered incidental to the contract.
- .9 Do not burn or bury rubbish and waste materials on-site. Clean concrete shall be deposited in an area designated for this purpose, and in accordance with demolition drawings and specification sections 01 74 21 and 02 41 99.
- .10 Remove all demolition, construction, and trade waste from the site and dispose outside of Historic Site land to a provincial approved landfill. Other salvaged or dispose materials to location as directed here within this document.

## **1.5 CANADIAN ENVIRONMENTAL ASSESSMENT ACT**

- .1 Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act Guidelines Order of 2003 and subsequent amendments. This project and its components, has been subject to an environmental assessment.
- .2 Failure to comply with or observe environmental protection measures as identified in these specifications may result in the work being suspended pending rectification of the problem.

## **1.6 WILDLIFE**

- .1 Avoid or terminate activities on-site that attract, disturb or harass wildlife and vacate the area and stay away from the immediate location if sheep, bears, cougars display

aggressive behaviour or persistent intrusion. Wildlife must be allowed to pass through the site freely.

- .2 Notify the Departmental Representative immediately of bear, snake or cougar activity, dens, nests, or wildlife encounters on or around the site. Other wildlife encounters should be reported within 24 hours.
- .3 During the Environmental Briefing all personnel shall be instructed on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns.
- .4 Pets will not be permitted on site.
- .5 Work within the requirements for migratory birds for work from April 1 to mid June.

## **1.7 DRAINAGE**

- .1 The Contractor shall prepare erosion and sediment management plan that identifies type and location of erosion and sediment controls to be provided. The desired end result is to allow no release into watercourses of sediments or deleterious substances. Similarly, there is to be no sediment or deleterious substance release into areas of vegetation growth or sensitive areas that would adversely alter growing or hydraulic conditions. This plan shall be to the satisfaction of the Departmental Representative. The plan will include monitoring and reporting to assure that control measures are in compliance with erosion and sediment control plan, federal, provincial and municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sedimentations control plan.
- .3 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .4 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Authority Having Jurisdiction requirements and in conformance with the Environmental Contaminants Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.

## **1.8 SITE CLEARING AND PLANT PROTECTION**

- .1 Protect trees on site and adjacent properties where indicated or as directed by the Departmental Representative. Any materials that inadvertently fall outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation in that location.
- .2 When working adjacent to existing trees the Contractor shall exercise all possible care to avoid injury to vegetation. Where roots or limbs over 25 mm in diameter and bark are

damaged during operations, trim damaged portion. The Departmental Representative will inspect all trimmed areas and approve them.

- .3 Tree removal shall be limited to trees identified for removal by the Departmental Representative.
- .4 Protect roots of trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .5 No stripping or vegetation removal shall occur outside the designated areas or as directed by Departmental Representative or Environmental Surveillance Officer (ESO).
- .6 Restrict tree removal to areas indicated or designated by the Departmental Representative.
- .7 Any contamination found during demolition will be tested, removed and disposed of in accordance with regulatory requirements including being hauled to a licensed landfill facility outside the site. Contaminated sites must be cleaned up to meet the standards established by the CCME Environmental Quality Guidelines for Soil and Water 2007 (with updates to 2012) and CCME Canada-Wide Standards for Petroleum Hydrocarbons in Soil 2008 for Residential/Parkland use.

#### **1.9 CONTRACTOR'S EMPLOYEE BRIEFING**

- .1 The Contractor shall conduct briefing sessions for all employees and subcontractor employees highlighting the requirements of this section, including operation of equipment strictly.
- .2 An initial site meeting with Contractor, and Departmental Representative will take place prior to construction commencing.
- .3 Departmental Representative may conduct briefing sessions for all employees and subcontractor employees highlighting the requirements of this specification section, and other requirements of the area including operations of equipment strictly within confines of the site; harassment or attraction of wildlife; pollution and garbage management; vehicle access and parking; and care of the environment in the work area.

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

- .1 Confine all operations to the work limits as staked or designated by the Departmental Representative. No activities of any kind may be carried out beyond these work limits without Departmental Representative's written approval.
- .2 Do not store or stockpile construction materials in the trees bordering or being preserved on-site. Do not unreasonably encumber the site with products.
- .3 Storage areas shall be located within the project boundaries on disturbed or hardened areas. Storage locations to be approved by Departmental Representative.
- .4 Storage locations shall be completely cleaned up and returned to original condition prior to Contractor de-mobilization in the spring, in the fall and finishing the project.

- .5 Equipment maintenance shall only be carried out in designated areas or as approved by the Departmental Representative. The use of on-site areas for equipment oil changes and other servicing will not be permitted.
- .6 Obtain permit from Authority Having Jurisdiction for on-site storage of fuel or other inflammable liquids. Observe all restrictions and conditions imposed by the permit regarding special protection and berming to control spills and tank damage, fire protection considerations, provisions for the disposal of fouled material and used petroleum products.
- .7 Conduct operations at all times in such a manner as to preserve the natural features and vegetation in the area. Cut and fill slopes shall be blended with adjoining topography. Material from fill slopes will not be permitted to sluff or roll into surrounding tree cover or to bury any plant material designated to be retained.
- .8 When, in the opinion of the Departmental Representative, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the staked or designated work area, the Contractor shall be responsible, at his expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc., to the satisfaction of the Departmental Representative.
- .9 Failure to comply with or observe environmental protection measures as identified in these specifications and the environmental assessment report may result in work being suspended pending rectification of the problems and operators of equipment being charged.
- .10 All wash from equipment and tools from concrete pour operations such as tools, concrete pumper and delivery trucks to be contained in such a manner not to dispose debris, cement and fines onto a hard surface or other surfaces that would allowed it to eventually enter the storm system, sanitary system, body of water or water course.
- .11 Review construction access requirements with the Departmental Representative both at start-up and an ongoing basis.
- .12 The contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by worker's vehicles or machinery and shall instruct workers so that the 'footprint' of the project is kept within defined boundaries. Areas around buildings requiring excavator or equipment access in natural areas should confine access as close to the edge of the walls as possible. Access requirements, once approved, will be flagged by the Environmental Surveillance Officer.
- .13 Work On and Adjacent to Steep Slopes: avoid equipment operation on steep slopes (e.g. when placing angular rock in eroded area and work on elevator shaft); Provide barriers in place to prevent rolling of debris down slopes onto highway or into vegetated areas.

#### **1.11 EQUIPMENT MAINTENANCE, FUELING, AND OPERATION**

- .1 Provide, operate, and maintain equipment as indicated in Environmental Assessment Amendment of this Project Manual and as follows:

- .2 The Contractor shall ensure that all soil, seeds and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) before delivery to the work site.
- .3 Equipment fuelling sites will be identified by the Contractor and approved by the Departmental Representative. Except for chain saws, any fuelling closer than 100 metres to any streams, wetlands, water bodies or waterways shall require the authorization and oversight of the Departmental Representative.
- .4 Diesel and gasoline delivery vehicles, including bulk tankers shall be parked more than 100 metres from any streams, wetlands, water bodies or watercourses. Gravity fed fuel systems are not allowed. Manual or electric pump delivery systems shall be used. Fuelling personnel shall maintain presence at and immediate attention to the fuelling operation.
- .5 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times.
- .6 Equipment used on the project shall be fuelled with E10, and low sulphur diesel fuels and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of vehicles is avoided.
- .7 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the ESO or the Departmental Representative. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. anywhere.
- .8 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order.
- .9 Fuel containers and lubricant products shall be stored only in secure locations specified by the Departmental Representative. Fuel tanks or other potentially deleterious substance containers shall be secured to ensure they are tamperproof and cannot be drained by vandals when left overnight.

## **1.12 NOISE AND VIBRATION CONTROL**

- .1 Low impact demolition equipment and methodologies shall be employed that do not generate significant noise or vibration levels in proximity to the sensitive wildlife habitat.
- .2 Demolition activities shall take place with the use of low noise and low ground vibration inducing equipment and techniques for the project site. For example, equipment could include but is not limited to a processor or pulverizer attached to an excavator.
- .3 High impact equipment known to cause higher noise levels and potential for higher ground vibrations shall be prohibited. Blasting, portable rock crushers and large jackhammers are not permitted.

- .4 Contractor to submit for review a written procedure for concrete demolition at least 2 weeks prior to commencement of site work. Written procedure shall include descriptions of equipment, methods, and tools.

### **1.13 WORK ADJACENT TO WATERWAYS**

- .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material without Departmental Representative's approval.
- .3 Do not dump excavated fill, waste material or debris in waterways.
- .4 Design and construct temporary crossings to minimize erosion to waterways.
- .5 Do not skid logs or construction materials across waterways.

### **1.14 POLLUTION CONTROL**

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for the Work. The Contractor shall prepare a dust management plan as part of their EPP to be approved by the Departmental Representative.
- .5 The Contractor shall prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Hazardous or toxic products shall be stored no closer than 100 metres from any watercourse.
- .6 A Spill Response Plan will be prepared by the Contractor as part of the EPP and shall detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products, to the satisfaction of the Departmental Representative and the ESO and in accordance with all applicable federal and provincial legislation. The EPP shall include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, sealer, grout, cement, concrete finishing agents, adhesives and sand blasting agents.
- .7 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation. Hazardous products shall be stored no closer than 100 metres from any watercourse.

- .8 An impervious berm shall be constructed around fuel tanks and any other potential spill area. The berms shall be capable of holding 110% of tank storage volumes and shall be to the satisfaction of the Departmental Representative and the ESO before start-up. Measures such as collection/drip trays and berms lined with occlusive material such as plastic and a layer of sand, and double-lined fuel tanks can prevent spills into the environment.
- .9 The Contractor shall prevent blowing dust and debris by covering and/or providing dust control for temporary roads and on-site work by methods that are approved by the Departmental Representative or ESO.
- .10 The Contractor shall provide spill kits at re-fuelling, lubrication, and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order on the construction site. The ESO and Departmental Representative prior to project start-up must approve these spill kits. The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
- .11 Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The Departmental Representative and the ESO shall be notified immediately of any spill. If not available contact the Local Fire Department immediately. Spill response cards will be distributed during the initial Environmental Briefing with basic instructions and phone numbers.
- .12 In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- .13 The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Departmental Representative and ESO.

#### **1.15 NOTIFICATION**

- .1 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 Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
- .3 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**

**Part 3          Execution**

**3.1              NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1            This work shall be incidental to contract and will not be measured for payment.

**1.2                REFERENCES**

- .1            Saskatchewan Ministry of Highways and Infrastructure Standard Specifications Manual
- .2            Saskatchewan Ministry of Highways and Infrastructure Standard Test Procedures Manual
- .3            Canadian Standards Association (CSA) CAN/CSA-A23.2-04, Methods of Test and Standard Practices for Concrete

**1.2                TESTING BY THE CONTRACTOR**

- .1            The Contractor shall be fully responsible and bear all costs for all quality control testing and shall conduct such testing in the following manner:
  - .1            Provide testing facilities and personnel for the tests and inform the Departmental Representative in advance to enable the Departmental Representative to witness the tests if it so desired;
  - .2            Notify the Departmental Representative when sampling will be conducted;
  - .3            Within one Day after completion of testing, submit test results to the Departmental Representative; and
  - .4            Identify test reports with the name and address of the organization performing all tests, and the date of the tests.
- .2            All testing required to meet the specifications is considered Quality Control testing and shall be conducted by a certified material and testing agency to be engaged and paid by for the contractor at no additional cost to the Work.
- .3            Testing required to provide quality control to assure that the Work strictly complies with the Contract requirements shall include, but not be limited to:
  - .1            All testing specified in the Contract Documents; and
  - .2            Any other testing required as a condition for deviation from the specified Contract procedures.
- .4            Approval of tested samples will be for characteristics or use named in such approval and shall not change or modify any Contract requirements.
- .5            Testing agencies, their inspectors, and their representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the Contract Documents, nor to approve or accept any part of the Work.

**1.3**

### **1.3 INSPECTION**

- .1 The Contractor shall 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 Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

### **1.4 INDEPENDENT INSPECTION AGENCIES**

- .1 Independent Inspection/Testing Agencies will be engaged by Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Contractor.
- .2 The Contractor shall provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility of the Contractor to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative, the Contractor shall pay costs for retesting and reinspection.

### **1.5 PROCEDURES**

- .1 The Contractor shall notify 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 The Contractor shall 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 The Contractor shall remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been

rejected by Departmental Representative as failing to conform to Contract Documents.  
Replace or re-execute in accordance with Contract Documents.

- .2 Make good other Contractor's work damaged by such removals or replacements promptly to the satisfaction of the Departmental Representative.
- .3 If in opinion of Departmental Representative, it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative 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 Departmental Representative.

## **1.7 REPORTS**

- .1 The Contractor shall submit electronic copies of all inspection and test reports to Departmental Representative in accordance with Section 01 33 00 Submittal Procedures.
- .2 The Contractor may provide copies of inspection and test reports to Trade Contractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

## **Part 2 Products**

- .1 Materials and products shall be in accordance with the most current version of the Saskatchewan Government Ministry of Highways and Infrastructure Standard Specifications, or as directed by the Departmental Representative.

## **Part 3 Execution**

### **3.1 NOT USED**

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.2 SUBMITTALS**

- .1 The Contractor shall provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

**1.3 INSTALLATION AND REMOVAL**

- .1 The Contractor shall provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

**1.4 DEWATERING**

- .1 The Contractor shall provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

**1.5 WATER SUPPLY**

- .1 The Contractor shall provide continuous supply of potable water for construction use.

**1.6 TEMPORARY HEATING AND VENTILATION**

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted.
- .3 The Contractor and the Department Representative shall determine the level of propane in Department Representative's propane tank(s) prior to start construction. The Contractor is fully responsible for the propane tank(s) and provide fuel at their cost. At the Contractor's discretion, the Contractor shall remove and dispose of the propane tanks as part of the Work.
- .4 Provide temporary heat and ventilation in enclosed areas as required to:
  - .1 Facilitate progress of Work.
  - .2 Protect Work and products against dampness and cold.
  - .3 Prevent moisture condensation on surfaces.
  - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  - .5 Provide adequate ventilation to meet health regulations for safe working environment.

- .5 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .6 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Ventilate temporary sanitary facilities.
  - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .7 Permanent heating system of building is not available for use.
- .8 The Contractor shall pay all costs for maintaining temporary heat.
- .9 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform with applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct-fired combustion units to outside.
- .10 The Contractor shall be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

## **1.7 TEMPORARY POWER AND LIGHT**

- .1 The Contractor shall be responsible for all temporary power during construction for temporary lighting and operating of power tools.
- .2 Provide and maintain temporary lighting throughout project as required to maintain safe working conditions.

## **1.8 TEMPORARY COMMUNICATION FACILITIES**

- .1 Provide and pay for temporary cell phone and data device lines necessary for own use.

## **1.9 FIRE PROTECTION**

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted.

- .3 Grasslands National Park do not provide or have any fire protection services.

**Part 2 Products**

**2.1 NOT USED**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
  - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-0121-08, Douglas Fir Plywood.
  - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
  - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .3 U.S. Environmental Protection Agency (EPA) / Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.2                SUBMITTALS**

- .1 The Contractor shall provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

**1.3                INSTALLATION AND REMOVAL**

- .1 The Contractor shall prepare site plan indicating the proposed location and dimensions of the area to be fenced and used by the Contractor, including the number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Indicate use of supplemental or other staging area.
- .3 Provide construction facilities in order to execute work expeditiously.
- .4 Remove from site all such work after use.

**1.4                SCAFFOLDING**

- .1 Scaffolding shall be erected and maintained by the Contractor in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, and platforms.

**1.5                HOISTING**

- .1 The Contractor shall provide, operate and maintain hoists cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists cranes to be operated by qualified operator.

**1.6 SITE STORAGE/LOADING**

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

**1.7 CONSTRUCTION PARKING**

- .1 Limited parking will be permitted on site provided it does not disrupt performance of Work.
- .2 The Contractor shall provide and maintain adequate access to project site for authorized personnel.
- .3 Follow vehicle parking limitations and permit requirements with the local authorities.
- .4 Personal vehicles shall not be parked on any natural or undisturbed areas. Parking will be confined to parking lots and roads or as approved by the Departmental Representative.

**1.8 OFFICES**

- .1 A Construction Office may be included, at the Contractors discretion and expense. Coordinate exact location with Departmental Representative.
- .2 No access to Parks Canada Buildings will be provided. Departmental Representative may grant access to use of one of the building meeting rooms for full project team weekly/bi-weekly meetings only.
- .3 The Contractor shall supply and make available a marked and fully stocked first-aid case in a readily available location.

**1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE**

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

**1.10 SANITARY FACILITIES**

- .1 Provide portable sanitary facilities.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

**1.11 CONSTRUCTION SIGNAGE**

- .1 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .2 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

- .3 Company signage is allowed on trailers or vehicles, not elsewhere on site.

#### **1.12 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .2 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .3 Protect travelling public from damage to person and property.
- .4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .6 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .7 Dust control: adequate to ensure safe operation at all times.
- .8 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .9 Snow Removal. Contractor is responsible for snow clearing within their work site including parking lots, sidewalks, etc as shown in the drawings 'Limit of Work'.

#### **1.13 CLEAN-UP**

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.

#### **1.14 FIRE PROTECTION FACILITIES**

- .1 Provide fire extinguisher and other equipment on site and maintain emergency vehicle access at all times.

#### **1.15 DISRUPTION**

- .1 Provide dust protection and schedule noisy work accordingly, as not to affect general public, traffic, and adjacent facilities.
- .2 No excessive noise will be permitted. Demolition methods that contribute to excessive noise will not be permitted. Low vibration and noise demolition equipment shall be used throughout the project. Best management practices will be followed by the Contractor to reduce noise on site. Equipment and vehicles shall be in good working condition and fitted with proper noise suppressing devices. Combine noisy operations to occur in the same time period. The Contractor is to take care when dropping materials from a height,

for example, when dumping concrete material into the basement. Minimize drop heights at material transfer locations. Shut or throttle down equipment (e.g. backhoes, loaders, generators, bobcats) whenever they are not in actual use. If in the opinion of the Departmental Representative there is excessive noise, the Contractor will adjust the work schedule of the activity, reduce the sound levels (e.g. use of sound barriers), or implement alternative demolition processes or quieter equipment.

**Part 2            Products**

**2.1                NOT USED**

**Part 3            Execution**

**3.1                TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1            The Contractor shall 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 the local authority.
- .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.

**END OF SECTION**

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1            The work concerning temporary barriers and enclosures shall be incidental to contract and will not be measured for payment.

**1.2                REFERENCES**

- .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 O121-08, Douglas Fir Plywood.

**1.3                INSTALLATION AND REMOVAL**

- .1            The Contractor shall provide temporary controls in order to execute Work expeditiously.
- .2            The Contractor shall remove from site all such work after use.

**1.4                GUARD RAILS AND BARRICADES**

- .1            The Contractor shall provide secure, rigid guard rails and barricades around deep excavations and open edges of floors and roofs.

**1.5                WEATHER ENCLOSURES**

- .1            The Contractor shall provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs where required to keep partially demolished materials within existing buildings, and not allowing wind-blown debris to depart and be dispersed in an un-authorized manner.

**1.6                ACCESS TO SITE**

- .1            The Contractor shall provide and maintain access roads, sidewalk crossings, and ramps as may be required for access to Work.

**1.7                FIRE ROUTES**

- .1            The Contractor shall maintain access to property including overhead clearances for use by emergency response vehicles.

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

- .1            The Contractor shall protect surrounding private and public property from damage during performance of Work.
- .2            The Contractor will 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**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1            This work shall be incidental to the Contract and will not be measure for payment.

**1.2                REFERENCES**

- .1            Within text of each specifications section, reference may be made to reference standards.
- .2            The Work shall conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3            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.
- .4            Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

**1.3                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.

**1.4                AVAILABILITY**

- .1            Immediately upon signing Contract, review project delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2            In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

## **1.5 STORAGE, HANDLING AND PROTECTION**

- .1 The Contractor shall handle and store products in manner to prevent damage, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 The Contractor shall store products subject to damage from weather in weatherproof enclosures.
- .3 The Contractor shall store cementitious products clear of earth or concrete floors, and away from walls.
- .4 The Contractor shall remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

## **1.6 TRANSPORTATION**

- .1 The Contractor shall pay costs for transportation of products required in the performance of the Work.

## **1.7 QUALITY OF WORK**

- .1 The Contractor shall ensure the Quality of Work is of the highest standard, executed by licensed or qualified 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.

## **1.8 CO-ORDINATION**

- .1 The Contractor shall ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

## **1.9 PROTECTION OF WORK IN PROGRESS**

- .1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

## **1.10 EXISTING UTILITIES**

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities including Owners utilities, with minimum of disturbance to Work, and/or building occupants. Make arrangements with Departmental Representative.

- .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**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1            This work shall be incidental to the contract and will not be measured for payment.

**1.2                EXISTING SERVICES**

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

**1.3                QUALIFICATIONS OF SURVEYOR**

- .1            The Contractor shall procure a qualified registered land surveyor, licensed to practice in Place of Work, acceptable to the Departmental Representative.

**1.4                SURVEY REFERENCE POINTS**

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

**1.5                SURVEY REQUIREMENTS**

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

- .8 Establish lines and levels for mechanical and electrical work.

**1.6 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.

**1.7 SUBMITTALS**

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of the Departmental Representative, the Contractor shall 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.

**1.8 SUBSURFACE CONDITIONS**

- .1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

**Part 2 Products**

**2.1 NOT USED**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                SUBMITTALS**

- .1        Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Submit written request in advance of cutting or alteration which affects:
  - .1        Structural integrity of elements of project.
  - .2        Integrity of weather-exposed or moisture-resistant elements.
  - .3        Efficiency, maintenance, or safety of operational elements.
  - .4        Visual qualities of sight-exposed elements.
  - .5        Work of Departmental Representative or separate contractor.
- .3        Include in request:
  - .1        Identification of project.
  - .2        Location and description of affected Work.
  - .3        Statement on necessity for cutting or alteration.
  - .4        Description of proposed Work, and products to be used.
  - .5        Alternatives to cutting and patching.
  - .6        Effect on Work of Departmental Representative or separate contractor.
  - .7        Written permission of affected separate contractor.
  - .8        Date and time work will be executed.

**1.2                MATERIALS**

- .1        Required for original installation.
- .2        Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

**1.3                PREPARATION**

- .1        Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2        After uncovering, inspect conditions affecting performance of Work.
- .3        Beginning of cutting or patching means acceptance of existing conditions.
- .4        Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5        Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

**1.4                EXECUTION**

- .1        Execute cutting, fitting, and patching including excavation and fill, to complete Work.
- .2        Fit several parts together, to integrate with other Work.

- .3 Remove and replace defective and non-conforming Work.
- .4 Remove samples of installed Work for testing.
- .5 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .6 Restore work with new products in accordance with requirements of Contract Documents.
- .7 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

**1.5 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.

**Part 2 Products**

**2.1 NOT USED**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCES**

- .1        Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions "C", In Effect as Of: May 14, 2004.

**1.2                PROJECT CLEANLINESS**

- .1        The Contractor shall;
  - .1        Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Departmental Representative.
  - .2        Remove waste materials from site at daily regularly scheduled times or dispose of outside of property. Do not burn waste materials on site.
  - .3        Clear snow and ice from access to building including parking lot and sidewalks, bank/pile snow in designated areas only as directed by Departmental Representative.
  - .4        Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
  - .5        Provide on-site containers for collection of waste materials and debris.
  - .6        Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .7        Store volatile waste in covered metal containers, and remove from premises at end of each working day.
  - .8        Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
  - .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 the Contractor shall:
  - .1        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 including that was caused by Departmental Representative.
  - .5        Remove waste materials from site at regularly scheduled times or dispose of outside of property. Do not burn waste materials on site.
  - .6        Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
  - .7        Sweep and wash clean paved areas.

**1.4 WASTE MANAGEMENT AND DISPOSAL**

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

**Part 2 Products**

**2.1 NOT USED**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                WASTE MANAGEMENT GOALS**

- .1        Prior to start of Work the Contractor shall conduct a meeting with the Departmental Representative to review and discuss Waste Management Goals.
- .2        Waste Management Goal: as much as possible of total Project Waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

**1.2                DEFINITIONS**

- .1        Class III: non-hazardous waste - construction renovation and demolition waste.
- .2        Inert Fill: inert waste - exclusively asphalt and concrete.
- .3        Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .4        Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .5        Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .6        Separate Condition: refers to waste sorted into individual types.
- .7        Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

**1.3                STORAGE, HANDLING AND PROTECTION**

- .1        Store, materials to recycled and salvaged are to be removed from site to recycling facility without storing on site. Materials to be recycled on site are to be placed in final location with minimum of rehandling. Stockpiles of concrete in areas other than final buried location will not be permitted.
- .2        Unless specified otherwise, materials for removal become Contractor's property.
- .3        Separate recyclable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility. Transport and deliver recyclable items to recycling facilities.
- .4        Protect surface drainage, mechanical and electrical from damage and blockage.
- .5        Separate and store materials produced during dismantling of structures in designated areas.

- .6 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
  - .1 On-site source separation is recommended.
  - .2 Remove co-mingled materials to off-site processing facility for separation.

#### **1.4 LIST OF SALVAGE ITEMS**

- .1 As indicated on the Drawings.

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

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, and paint thinner into waterways, storm, or sanitary sewers.
- .3 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

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

- .1 Execute work with least possible interference or disturbance to normal use of premises.

#### **1.7 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**

### **Part 3 Execution**

#### **3.1 APPLICATION**

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

#### **3.2 CLEANING**

- .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.
- .3 Source separate materials to be reused/recycled into specified sort areas.
- .4 Dispose of materials at licensed facilities.

**3.3 DIVERSION OF MATERIALS**

- .1 On-site sale of recyclable materials is not permitted.

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

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

Province	Address	General Inquires	Fax
Saskatchewan	Saskatchewan Environment and Resource Management 3211 Albert Street Regina SK S4S 5W6	306-787-2700	306-787-3941

**END OF SECTION**

**1.1 General**

**1.2 MEASUREMENT PROCEDURES**

- .1 This work shall be incidental to contract and will not be measured for payment.

**1.3 RELATED SECTIONS**

- .1 Section 01 78 00 – Closeout Submittals

**1.4 INSPECTION AND DECLARATION**

- .1 Contractor's Inspection: Contractor and Subcontractors: 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 that corrections have been made.
  - .2 Request Departmental Representative's Inspection.
- .2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3 Completion: The Contractor shall submit written certificate that following have been performed:
  - .1 Work has been completed and inspected for compliance with Contract Documents.
  - .2 Defects have been corrected and deficiencies have been completed.
  - .3 Work is complete and ready for final inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative, and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

**1.5 CLEANING**

- .1 In accordance with Section 01 74 11 - Cleaning.
- .2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**Part 2            Products**

**2.1                NOT USED**

**Part 3            Execution**

**3.1                NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1            This work shall be incidental to contract and will not be measured for payment.

**1.2                SUBMITTALS**

- .1            Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2            Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3            Copy will be returned after final inspection, with Departmental Representative's comments.
- .4            Revise content of documents as required prior to final submittal.
- .5            Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative four final hard copies and two flash drives in pdf format of operating and maintenance manuals in English.
- .6            Furnish evidence, if requested, for type, source and quality of products provided.
- .7            Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8            Pay costs of transportation.

**1.3                FORMAT**

- .1            Organize data as instructional manual.
- .2            Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3            When multiple binders are used correlate data into related consistent groupings. 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, process flow, 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.
- .7            Text: manufacturer's printed data, or typewritten data.
- .8            Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

- .9 Provide marked up red-line drawings to the Consultant for them to update the drawings, 1:1 scaled CAD files in dwg format on CD.

#### **1.4 CONTENTS - EACH VOLUME**

- .1 Table of Contents: 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. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

#### **1.5 AS-BUILTS AND SAMPLES**

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. 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. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

## **1.6 RECORDING ACTUAL SITE CONDITIONS**

- .1 Record information in red on set of blue line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish first floor datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by change orders.
  - .6 Details not on original Contract Drawings.
  - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

## **1.7 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.
- .2 Provide survey complete with utilities indicated.

## **1.8 MAINTENANCE MATERIALS**

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to location as directed; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

- .5 Obtain receipt for delivered products and submit prior to final payment.

**1.9 STORAGE, HANDLING AND PROTECTION**

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

**Part 2 Products**

**2.1 NOT USED**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1           General**

**1.1               REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA S350-[M1980(R1998)], Code of Practice for Safety in Demolition of Structures.

**1.2               SUBMITTALS**

- .1 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Sections 01 74 21 - Construction/Demolition Waste Management and Disposal and 01 35 43 Environmental Procedures and indicate:
  - .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.
  - .2 Name and address of waste facilities.

**1.3               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.

**1.4               MEASUREMENT PROCEDURES**

- .1 Site Demolition:
  - .1 Measurement: No measurement shall be made of this item.
  - .2 Payment: The price shall include demolition, removal, recycling of all items indicated on drawings and other work in line with work and all work and materials incidental thereto.

**Part 2           Products**

**2.1               NOT USED**

- .1 Not used.

**Part 3           Execution**

**3.1               PREPARATION**

- .1 Inspect site with 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 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
  - .1 Immediately notify Departmental Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.
  - .2 Immediately notify the Engineer should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

### **3.2 PROTECTION**

- .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features and parts of building to remain in place. Provide bracing and shoring required.
- .2 Keep noise, dust, and inconvenience to occupants to minimum.
- .3 Protect building systems, services and equipment.
- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.

### **3.3 SALVAGE**

- .1 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .2 Remove items to be reused, store as directed by Departmental Representative.

### **3.4 DISPOSAL**

- .1 Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.

**END OF SECTION**

**Part 1            General**

**1.1                DESCRIPTION**

- .1        This section specifies requirements for supplying, placing and compacting granular road structure to lines, grades and typical cross sections indicated on plans or as directed by the Departmental Representative

**1.2                DEFINITIONS**

- .1        Road Structure: design depth of granular material constructed immediately on the prepared sub grade, geotextile and geogrid stabilization structures.

**1.3                RELATED SECTIONS**

- .1        Section 31 22 16.13 – Roadway Subgrade Reshaping
- .2        Section 31 32 19.01 – Geotextile
- .3        Section 31 32 19.13 – Geogrid Soil Stabilization

**1.4                MEASUREMENT PROCEDURES**

- .1        **“Supply and install 200mm gravel crush compacted to 100% SPMDD”**, to be measured for payment in square meters of compacted material to a depth of 200mm to the lines and grades indicated on the approved construction drawings.
- .2        Supply, loading, hauling, placing, compacting, and conditioning by wetting / drying will be incidental to the Work.
- .3        No overhaul will be paid for this Work.
- .4        The price for supply and install of granular road structure does not include, subgrade preparation, geotextile or geogrid as they are paid separately under Section 31 22 16.13, Section 31 32 19.01 and Section 31 32 19.13.
- .5        Mobilization and demobilization required for this Work shall be incidental and no additional payment will be made.
- .6        Traffic Control required for this Work shall be incidental and no separate payment will be made.
- .7        Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures, for the Work in this Section shall be incidental to the contract and no separate payment will be made to the Contractor.

**1.5                REFERENCES**

- .1        Saskatchewan Highways and Transportation Standard Specification Manual (Latest Edition).

## 1.6 QUALITY CONTROL

- .1 All Quality Control testing shall be by a third party competent in materials testing. The cost of this testing shall be borne by the Contractor.

## Part 2 Products

### 2.1 MATERIALS

- .1 MHI Type 31 or 33 Granular Base Course materials shall be supplied by the Contractor in accordance with Saskatchewan Highways and Transportation Standard Specification Manual (Latest Edition).

## Part 3 Execution

### 3.1 PLACING AND COMPACTING

- .1 Contractor to place and compact MHI Type 31 or 33 Granular Base Course in accordance with Saskatchewan Highways and Transportation Standard Specification Manual (Latest Edition).
- .2 Compaction results shall be based on a minimum of one density test per 250 m<sup>2</sup> of road. Additional tests may be called for by the Parks Canada as deemed necessary.
- .3 Field density tests shall conform to ASTM D1 556, ASTM D21 67, or ASTM D2922 for comparison with a maximum density determined according to ASTM D698 Method “A”.
- .4 Compact to density of not less than 100% standard proctor maximum dry density (SPMDD) and with  $\pm 3\%$  of the optimum moisture content in accordance with ASTM D 698. Contractor to adhere to the considerations and recommendations section 4.0 in the “Rock Creek Campground - Geotechnical Assessment” (MCSL June 28, 2016).
- .5 Where specified by the Departmental Representative, place geotextile in accordance with Section 31 32 19.01.

### 3.2 ACCEPTANCE PARAMETERS

- .1 The Contractor shall not proceed with paving or otherwise covering a section of Granular Base Work until the underlying work is accepted by the Departmental Representative. Acceptance will be based on the following:
  - .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.
  - .2 **Rut Resistance** – Any aggregate supplied must, in addition to meeting the gradation requirements specified, not rut when proof rolled with a truck having a 9 tonne single axle dual tire or 17 tonne tandem axle group with dual tires with a tire pressure of 600kPa. Any aggregate which does rut shall be removed and replaced, or blended with suitable aggregates, to meet both the gradation requirement and the rut resistance requirement.

- .3 **Proof Rolling and Stabilizing Crushed Base Coarse** – Before acceptance, each compacted course of base aggregate shall receive one complete coverage by the tires of a truck having a 9 tonne single axle dual tire or 17 tonne tandem axle group with dual tires with a tire pressure of 600 kPa.
- .4 Any areas where rutting or displacement occurs shall be either excavated or replaced and proof rolled or stabilized by the addition of suitable blending material incorporated uniformly into the base to the satisfaction of the Departmental Representative.
- .5 The supply, load, haul, placing, proof rolling, and mixing of such stabilizing aggregates as necessary to correct deficiencies in aggregate stability shall be incidental to the Work. Blending may be performed at the pit or quarry or on the project in a manner acceptable to the Departmental Representative.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1            01 35 43 Environmental Procedures
- .2            01 45 00 Quality Control
- .3            01 51 00 Temporary Utilities
- .4            01 52 00 Construction Facilities
- .5            01 56 00 Temporary Barriers and Enclosures
- .6            01 74 21 Construction/Demolition Waste Management and Disposal

**1.2                REFERENCES**

- .1            U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1            EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.3                MEASUREMENT PROCEDURES**

- .1            Topsoil Stripping:
  - .1            Measurement: Measurement shall be made of physical stockpile by survey in cubic meters.
  - .2            Payment: The price shall include stripping, loading, hauling to a location within 1 km of site, dumping, shaping of stockpile, and all work and materials incidental thereto.

**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 outside of project boundaries according to Erosion and Sediment Control Plan.
- .2            Provide temporary erosion and sedimentation control measures around stockpile.
- .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 STRIPPING OF TOPSOIL**

- .1 Ensure that procedures are conducted in accordance with applicable Parks Canada 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 by alternative disposal.
- .5 Remove brush from targeted area by non-chemical means and dispose of through alternative disposal.
- .6 Strip topsoil to depths as indicated.
  - .1 50mm within project boundary.
  - .2 Avoid mixing topsoil with subsoil.
- .7 Pile topsoil in berms in locations as directed by Parks Representative.
  - .1 Stockpile height not to exceed 1.0m.
  - .2 Pile topsoil and grade the pile to give a natural appearance as directed by Parks Representative.
- .8 Location of stockpile to be within 1km of project area. Location to be in the area of the Park entry.
- .9 Protect stockpiles from contamination and compaction.
- .10 Contractor to apply seed if directed by Parks Representative at unit price rates.

**END OF SECTION**

**Part 1            General**

**1.1                DESCRIPTION**

- .1        This section specifies requirements for road excavation, road drainage excavation, borrow excavation, embankment construction and disposal of material in accordance with specification and conforming to lines, grades, dimensions, and typical cross sections shown of plans and as directed by the Departmental Representative.

**1.2                RELATED SECTIONS**

- .1        Section 31 11 42 – Granular Road Structure
- .2        Section 31 23 33.01 – Excavating, Trenching and Backfilling

**1.3                DEFINITIONS**

- .1        Topsoil Stripping: excavation and stockpiling of material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding
- .2        Common Excavation: excavation, placement and compaction in embankments of all on site material whatever nature, which are not included under the definition of topsoil stripping, waste excavation, borrow excavation or rock excavation, including dense tills, hardpan, frozen materials and partially cemented materials which can be ripped and excavated with heavy construction equipment.
- .3        Waste Excavation: excavation and removal from site or disposed on site as designated by engineer of any material unsuitable for use in work or surplus to requirements.
- .4        Rock Excavation: excavation of:
  - .1        Material from solid masses of igneous, sedimentary or metamorphic rock that, prior to removal, was integral with parent mass. Material that cannot be ripped with reasonable effort from Caterpillar D9L or equivalent to be considered integral with parent mass.
  - .2        Boulder or rock fragments measuring 1.5 cubic metres or more in volume.
- .5        Borrow Excavation: Excavation, delivery to site, placement and compaction of suitable material obtained off site and used in embankment.
- .6        Unsuitable Sub grade: Material at design sub grade level not suitable for pavement structure sub grade, shall be removed as directed by Engineer and replaced with suitable material.
- .7        Embankment: Material placed above original ground or in stripped or undercut areas up to sub grade elevation.

**1.4                REQUIREMENTS OF REGULATORY AGENCIES**

- .1        Adhere to provincial, and national codes if blasting is required.

## 1.5 TRAFFIC PROVISIONS

- .1 Provide and maintain roadways, walkways and detours for vehicular and pedestrian traffic as directed by the Departmental Representative.

## 1.6 PROTECTION

- .1 Existing Surface Features:
  - .1 Protect existing buildings, trees and other plants, lawns, fencing, service poles, wires or paving located within proximity of the work while work is in progress. Repair to the Departmental Representative's satisfaction any damage, which may occur.
- .2 Trees and Shrubs
  - .1 Where excavation necessitates root or branch cutting, do so only under direct control of the Departmental Representative.

## 1.7 SAFETY REQUIREMENTS

- .1 Adhere to provincial requirements relating to safety of trenching work, including shoring and bracing as required.
- .2 Adhere to all crossing permit (railway, pipeline, telecommunications duct, etc.) requirements.
- .3 Provide barricades, flares, etc. to adequately denote area of excavation adjacent to roadways.

## 1.8 MEASUREMENT PROCEDURES

- .1 **“Common Excavation to be placed on site at 98% SPMDD”**, to be measured and paid for in cubic meters. Quantity of measurement has been estimated as per the design drawings. Final measurement to be confirmed by means of survey or other volumetric tracking method if not survey pre-approved on site by the engineer and department representative. Common excavation is inclusive of all the native material movement undertaken within the roadways, campsite pads and pathways.
- .2 **“Excess road clay material to be removed and stockpiled offsite within 1000m haul distance”**, to be measured by final stockpile survey and paid for in cubic meters. No additional payment will be made for loading, hauling and placing of the material.
- .3 **“Subgrade Preparation to a depth of 300mm and compacted to 100% SPMDD”**, to be measured in square meters for the area prepared beneath the 7m wide main gravel road structure.
- .4 No measurement to be made for:
  - .1 Unnecessary excavation beyond lines established.
  - .2 Extra handling of windrowed materials blended on embankment slopes.
  - .3 Moisture adjustment of material.
  - .4 Construction, maintenance, and restoration of haul routes.
  - .5 Sub grade preparation in areas having fills greater than 300 mm.

.6 Overhaul.

## **Part 2 Products**

### **2.1 MATERIALS**

.1 Embankment Material

.1 Embankment materials to be approved by the Departmental Representative.

.2 Sub Grade Replacement Material

.1 Unsuitable sub grade will be removed and disposed of as directed by the Departmental Representative and replaced with suitable fill material from onsite common excavation material

## **Part 3 Execution**

### **3.1 EXCAVATION**

.1 Advise Departmental Representative sufficiently in advance of excavation operations for initial cross section to be taken.

.2 Maintain crowns, cross slopes, pumps or ditches to keep excavations free of running or standing water.

### **3.2 PLACING AND COMPACTING**

.1 Contractor complete subgrade preparation in accordance with Saskatchewan Highways and Transportation Standard Specification Manual (Latest Edition).

.2 Field compaction density tests shall conform to recommendations set out in Section 4.0 of the “Rock Creek Campground - Geotechnical Assessment” (MCSL June 28, 2016) report.

.3 Compaction results shall be based on a minimum of one density test per 1,000 m<sup>2</sup> of road. Additional tests may be called for by the Parks Canada as deemed necessary.

.4 Trench backfill encountered in the preparation of the subgrade which has not been compacted sufficiently, shall be excavated and re-compacted.

.5 The Contractor shall be responsible for any repair required to road works arising from subsidence of trenches after the completion of the maintenance period of the underground services.

### **3.3 TOPSOIL STRIPPING**

.1 Topsoil stripping to be executed as per Section 31 14 13 “Soil stripping and stockpiling”.

### **3.4 COMMON EXCAVATION**

.1 Material designated as common excavation to be excavated, hauled and compacted in designated fill areas on site.

### **3.5 WASTE EXCAVATION**

- .1 Notify the Departmental Representative whenever unsuitable materials are encountered in cut or embankment sections and remove unsuitable materials to depth and extent directed.
- .2 Dispose of waste excavation at designated waste site. If no waste site is designated dispose of material off site in an area located by contractor and approved by the Departmental Representative.

### **3.6 UNSUITABLE SUB GRADE**

- .1 Notify the Departmental Representative when unsuitable materials are encountered at design sub grade elevation. Sub cut and dispose of unsuitable material and replace with a compacted approved material. Material shall be placed in successive layers not exceeding 150 mm in depth and compacted to a minimum of 98% Standard Proctor Density.
- .2 When sub grade after sub cutting is still unsuitable, geotextile may be installed at direction of the Departmental Representative.

### **3.7 EMBANKMENTS**

- .1 Scarify bench or key in existing slopes in side hills or sloping sections to ensure a proper bond between new materials and existing surfaces. Obtain prior approval of method to be used.
- .2 Scarify existing ground to a depth of 150 mm and mix embankment material with existing materials to ensure a good bond.
- .3 Do not place material which is frozen, or place material on frozen surfaces.
- .4 Maintain a crowned surface during construction to ensure ready run off of surface water.
- .5 After a period of wet weather, remove or scarify, dry and re compact embankment materials softened by moisture.
- .6 Wetting or drying of fill material shall be carried out such that in place fill has a moisture content of +/-3% of optimum.
- .7 Construct and compact embankments to an elevation at least 50 mm above design elevations and cut back to design elevations.

### **3.8 PROOF ROLLING**

- .1 Proof rolling, (load testing) of the subgrade and at the surface of the finished granular base course level, shall be conducted on all new roadways. There shall representation by the consultant, contractor and Parks Representative (if available). Any areas showing deflection shall be rectified as required.
- .2 The Departmental Representative may authorize use of other acceptable proof rolling equipment. Alternately, use a single axle dual wheeled water truck with a load of 9,100 kg on the rear axle or a tandem gravel truck fully loaded to maximum GVW with tires inflated to a minimum of 275 kPa.

- .3 Make sufficient passes with proof vehicle to ensure the surface is subjected to a tire load within 500 mm of any point.
- .4 Where proof rolling reveals areas of deflection indicating defective sub grade, Departmental Representative shall determine limits of unsuitable sub grade excavation and shall specify replacement material / procedures and or structure as per the recommendations of a geotechnical consultant.

### **3.9 MAINTENANCE**

- .1 Maintain road surfaces until next course of material is places or until project or that portion thereof is accepted.

**END OF SECTION**

**Part 1 General**

**1.1 DESCRIPTION**

- .1 This section specifies requirements for excavating trenches and backfilling for installation of water mains and their appurtenances.

**1.2 RELATED SECTIONS**

- .1 Section 33 11 17 – HDPE Water Mains and Valves

**1.3 MEASUREMENT PROCEDURES**

- .1 There is **no additional payment** for “**Trench excavation, compaction and backfilling**”. This work is incidental to Section 33 11 17 and should be include in the linear meter measurement and payment of the “Water Mains supply and install” for 75 and 25mm HDPE pipe as per that section. Additionally, no payment for trenching, compaction and backfilling will be made for the Utility Septic Tank Section 33 36 00 or Spigot Assembly Section 33 11 18 and is considered incidental.
- .2 The cost of supplying, placing, maintaining and removal of shoring, bracing, cofferdams, underpinning and dewatering equipment will be incidental to the pipe installation. No extra payment will be made.
- .3 No additional payment will be made for the method selected for utility pipe installation, trenching and backfilling such as ditch witching, open trench or directional drilling.

**1.4 PROTECTION**

- .1 Existing Buried Utilities
  - .1 Size, depth and location of existing utilities shown on Drawings are for guidance only; completeness and accuracy are not guaranteed.
  - .2 Prior to commencing any excavation work, notify applicable utility authorities, Sask 1<sup>st</sup> call and establish location and state of use of buried services. Clearly mark such locations to prevent disturbance during work.
  - .3 Maintain and protect from damage, water, sewer, gas, electric or other utilities encountered.
  - .4 Obtain written authorization of Owner of utility and the Departmental Representative before moving or otherwise disturbing utility.
- .2 Existing Surface Features
  - .1 Protect existing buildings, trees and other plants, lawns, fencing, service poles, wires or paving located within right of way or adjoining properties from damage while work is in progress. Repair to Engineer’s satisfaction any damage which may occur.
  - .2 Where excavation necessitates root or branch cutting do so only under direct control of the Departmental Representative.
  - .3 Protect existing trees and shrubs whenever possible during trenching activities.
- .3 Shoring and Bracing

- .1 Whenever shoring, sheeting, timbering and bracing of excavations is required, engage services of a professional engineer to design and assume responsibility for adequacy of shoring and bracing.
- .2 When requested by the Departmental Representative, submit for review drawings and calculations signed and stamped by the professional engineer responsible for their preparation.
- .3 Close sheeting, when required, to be designed and constructed to prevent adjacent soil or water from entering excavation.
- .4 Flooding
  - .1 Protect open excavation against flooding and damage from surface water runoff or groundwater seepage.

## **1.5 SAFETY REQUIREMENTS**

- .1 Observe and adhere to all applicable sections of the Occupational Health and Safety Act covering the worker safety in trenches and excavations, shoring and bracing as required. Open cut trenches shall be shaped as required by the Act and the Accident Prevention Regulations of the Occupational Health and Safety Division of the Department of Labor and Municipal Ordinances and as may be necessary to protect life, property, the environment and the Work.
- .2 Adhere to all crossing permit (railway, pipeline, telecommunications, etc) requirements.
- .3 Provide barricades, flares, etc. to adequately denote area of excavation adjacent to roadways and public thoroughfares.

## **Part 2 Products**

### **2.1 BEDDING AND INITIAL BACKFILL MATERIALS**

- .1 Native soil may be used for backfill material, unfrozen and free from deleterious material and with moisture content within 2% of optimum.

### **2.2 ROADWAY TRENCH BACKFILL MATERIAL**

- .1 To minimize fill settlement under self-weight, excavated soil with a moisture content exceeding 2% of optimum shall be conditioned and dried prior to use as backfill.
- .2 Wet fill material must be dried or blended with drier material to produce a uniform homogenous material prior to use as a trench backfill.

## **Part 3 Execution**

### **3.1 SITE PREPARATION**

- .1 Remove trees, shrubs, vegetation, fences and other obstructions, ice and snow, from surfaces to be excavated within limits indicated on the approved construction drawings.

- .2 Strip top soil from within limits of excavation and stockpile as directed, for respreading after backfilling. Avoid intermixing of subsoil fill materials with organic material and from other forms of contamination.

### 3.2 DEWATERING

- .1 Keep excavation dry while work is in progress.
- .2 Dispose of water in a manner not detrimental to public health, environment, public and private property or any portion of work completed or under construction.

### 3.3 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions indicated on drawing. Existing ground profiles are approximate only. If an open trench method is used for pipe installation, then;
  - .1 The Contractor shall confine his activities to the immediate area of the trench. All activities outside trench boundaries shall be performed so as not to damage other existing features. Every effort shall be made to restrict the trench widths to minimize the area disturbed.
  - .2 All excavated material shall be piled at least 1.0 m clear of the trench top to prevent material from falling back into the excavation. The material shall be piled in such a manner that it will not endanger the work, or obstruct other work or rights-of-way. Sufficient clear space must be left on one side of the trench to accommodate the surveyor's stakes.
- .2 Notify the Departmental Representative when soil at proposed elevation of trench bottom appears unsuitable for backfill. Remove unsuitable material and replace with material approved by the Departmental Representative.
- .3 Notify the Departmental Representative if new construction conflicts with a discovered obstruction. Allow engineer sufficient time to consider alternative alignment to avoid conflict with obstruction. Modify alignment as directed by the Departmental Representative
- .4 Unless otherwise authorized by the Departmental Representative, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m of open trench at end of days' operation.
- .5 Place suitable excavated materials required for trench backfill in approved location.
- .6 Dispose of surplus and unsuitable material at a location approved by the Departmental Representative.
- .7 Do not obstruct flow of surface drainage or natural watercourses.
- .8 The Contractor shall confirm the method selected for excavation such as ditch witching, open trench or directional drilling with the Departmental Representative.
- .9 Excavate rock if encountered to a level 150 mm below the invert of the pipe.

### **3.4 TRENCH BOTTOM PREPARATION**

- .1 Where required due to removal of unsuitable material or unauthorized over excavation, bring bottom of excavation to design grade with approved native material.

### **3.5 PIPE BEDDING AND INITIAL BACKFILL**

- .1 Bedding
  - .1 Native soil may be used for bedding material, unfrozen and free from deleterious material and with moisture content within 2% of optimum.

### **3.6 BACKFILLING**

- .1 General backfilling:
  - .1 Native soil shall be used as backfill material.
  - .2 No boulders, rock, ice, snow, organic material or debris shall be permitted in the trench. These unsuitable materials shall be hauled away.
  - .3 All surplus excavated material shall also be hauled away, or disposed of as directed. In the event of deficiency of backfill material, suitable material shall be supplied by the Contractor at his expense.
  - .4 All trenches shall be backfilled as the work proceeds and no more than 15 m shall be left open at the end of a day's work.

### **3.7 BACKFILL COMPACTION**

- .1 The Contractor shall be responsible for adequate compaction of the trenches and for the correction of settlement during the maintenance period of the Contract. Mechanical compaction equipment shall not be used until there is sufficient cover to prevent damage to the pipe.
- .2 The type of compaction equipment shall be chosen with regard to minimizing the vibration effect on nearby buildings and utilities. The Contractor shall inspect the condition of buildings prior to construction. The Contractor is responsible for any damage caused to buildings due to construction.

### **3.8 TESTING BACKFILL COMPACTION**

- .1 Compaction results shall be based on a minimum of one density test per 100 meters of trench for each 1.0 meter of compacted vertical backfill. Additional tests may be called for by the Owner as deemed necessary.
- .2 If a density test indicates insufficient compaction at any depth, then two more densities, that are proportionally representative of trench length, shall be taken at that depth. If the average of these tests is below the required density, the trench shall be re-excavated and re-compacted to meet the specified density.
- .3 This testing in no way relieves the Contractor of his maintenance responsibilities with respect to settlements as specified. The Contractor shall repair any settlement and damaged surface improvements due to the settlement which occurs during the maintenance period.

- .4 The cost of all initial testing will be borne by the Contractor. Non-conformity with the specified density or moisture content shall constitute sufficient grounds for rejection of the work.
- .5 Compaction in the pipe zone (300mm above the obvert of the pipe and below) shall be to 95% SPMDD. Compaction above the pipe zone shall be to 98% SPMDD.

### **3.9 RESTORATION**

- .1 Replace topsoil as directed by Departmental Representative.
- .2 Restore traveled areas to the pavement or concrete structure shown on the contract drawing.
- .3 Clean and reinstate areas affected by work as directed.

**END OF SECTION**

**Part 1            General**

**1.1                DESCRIPTION**

- .1        This section includes the materials and installation of polymeric geotextiles used in; retaining wall structures, filtration, drainage structures, erosion control and roadbeds for which the purpose is to act as hydraulic filters permitting passage of water while retaining soil strength of granular structure.

**1.2                MEASUREMENT PROCEDURES**

- .1        **“Road structure non woven Geotextile Nilex 4551 or approved equivalent”** to be paid by square meter for supply and install.

**1.3                RELATED SECTIONS**

- .1        Section 31 22 16.13 – Roadway Subgrade Reshaping
- .2        Section 31 11 42 – Granular Road Structure

**1.4                REFERENCES**

- .1        American Society for Testing and Materials International, (ASTM)
  - .1        ASTM D4491-99a, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  - .2        ASTM D4595-86(2001), Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
  - .3        ASTM D4716-01, Test Method for Determining the (In-Plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
  - .4        ASTM D4751-99a, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2        Canadian General Standards Board (CGSB)
  - .1        CAN/CGSB-4.2 No. 11.2-M89(April 1997), Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
  - .2        CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
  - .3        No. 2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.
  - .4        No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.
  - .5        No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
  - .6        No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
  - .7        No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.
- .3        Ontario Provincial Standard Specifications (OPSS)
  - .1        OPSS 1860-March 1998, Material Specification for Geotextiles.

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

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

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with the EPP.
- .3 Fold up metal banding, flatten and place in designated area for recycling.

## **Part 2 Products**

### **2.1 GEOTEXTILES**

- .1 Non- Woven Geotextile:
  - .1 To be Nilex 4551,
  - .2 Or approved equivalent

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Filter Fabric Requirements:
  - .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with Pins.
  - .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
  - .3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
  - .4 Overlap each successive strip of geotextile 600 mm over previously laid strip.
  - .5 Join successive strips of geotextile by sewing.
  - .6 Pin successive strips of geotextile with securing pins at 3m intervals.
  - .7 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
  - .8 After installation, cover with overlying layer within 8h of placement.
  - .9 Replace damaged or deteriorated geotextile to approval of Departmental Representative.
  - .10 For additional specifications see section 4.0 of the “Rock Creek Campground - Geotechnical Assessment” (MCSL June 28, 2016) report.

### **3.2 CLEANING**

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

**3.3 PROTECTION**

- .1 Vehicular traffic not permitted directly on geotextile.

**END OF SECTION**

**Part 1           General**

**1.1               DESCRIPTION**

- .1       This section specifies requirements for the procurement, handling, and placement of soil reinforcing geogrid products as shown on plans established by the Departmental Representative.

**1.2               MEASUREMENT PROCEDURES**

- .1       **“Road structure TX 160 Geogrid supply and install or approved equivalent”**, to be paid by the square meter for supply and install.

**1.3               RELATED SECTIONS**

- .1       Section 31 22 16.13 – Roadway Subgrade Reshaping
- .2       Section 31 11 42 – Granular Road Structure

**1.4               SUBMITTALS**

- .1       In the event that a product other than that which is specified in the Construction Drawings is proposed by the Contractor the Contract shall submit a sample of the proposed substitution to the engineer along with appropriate technical literature from both the manufacturer and a testing facility approved of by the Departmental Representative. The Departmental Representative shall have full authority to accept or reject any substitution for any reason(s) they find relevant.

**1.5               DELIVERY, STORAGE AND HANDLING**

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

**1.6               WASTE MANAGEMENT AND DISPOSAL**

- .1       Separate and recycle waste materials in accordance with approved Environmental Procedures.
- .2       Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3       Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with the EPP.
- .4       Fold up metal banding, flatten and place in designated area for recycling.

**Part 2           Products**

**2.1               MATERIALS**

- .1       Geogrid Tensar Tri-Axial 160
- .2       Or approved equivalent

**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Filter Fabric Requirements:
- .1 Place geogrid by unrolling onto graded surface in orientation, manner and location indicated and retain with pins.
  - .2 Place geogrid material smooth and free of tension stress, and folds.
  - .3 Overlap each successive strip of geotextile 600 mm over previously laid strip.
  - .4 Pin successive strips of geogrid with securing pins at 3m intervals.
  - .5 Protect installed geogrid from displacement, damage or deterioration before, during, and after installation, cover with overlying layer within 8 hours of placement.
  - .6 Replace damaged or deteriorated geogrid to approval of Departmental Representative.
  - .7 For additional specifications see section 4.0 of the “Rock Creek Campground - Geotechnical Assessment” (MCSL June 28, 2016) report.

**3.2 CLEANING**

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

**3.3 PROTECTION**

- .1 Vehicular traffic not permitted directly on geogrid.

**END OF SECTION**

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1        **“Reinforced concrete pad”** to be paid for per square meter for supply and install including delivery, testing, forming, cutting and tooling. Square meter cost to include the forming and pouring of the 75mm high x 140mm wide concrete curb along the west edge of the concrete pad as per typical concrete RV pad section on drawing C1.4.
- .2        Price for subgrade preparation, geotextile and granular material will be paid for in each of the respective sections shown in 1.2 below.

**1.2                RELATED SECTIONS**

- .1        Section 31 22 16.13 – Roadway Subgrade Reshaping
- .2        Section 31 11 42 – Granular Road Structure
- .3        Section 31 32 19.01 – Geotextile
- .4        Section 31 32 19.13 – Geogrid Soil Stabilization

**1.3                REFERENCE STANDARDS**

- .1        Supply of ready mixed concrete in accordance with CAN3-A23.1 and testing of ready mixed concrete in accordance with CAN3-A23.2 except where specified otherwise

**Part 2            Products**

**2.1                GENERAL**

- .1        Concrete shall consist of the following components:
  - .1        Aggregates
    - .1        Coarse aggregate; greater than 5 mm particle size;
    - .2        Fine aggregate; less than 5 mm particle size of natural or approved manufactured sand.
  - .2        Paste
    - .1        Portland Cement;
    - .2        Supplementary cementing materials;
    - .3        Water;
    - .4        Air entraining admixture;
    - .5        Additional admixtures where permitted by the Departmental Representative.

**2.2                AGGREGATE MATERIALS**

- .1        General

- .1 Records of the testing of all aggregates used for the production of concrete must be maintained and be disclosed to the Departmental Representative upon request.
- .2 Fine Aggregate
  - .1 Fine aggregate shall meet the requirements of CSA/CAN3-A23.1 except as modified by the following paragraphs:
  - .2 Fine aggregate shall be natural sand or approved manufactured sand, washed clean, having hard strong sharp durable uncoated grains and shall be free from injurious amount of dust, lumps sot or flaky particles, mica, shale, alkali, organic matter. Loam or other deleterious substance. Sand shall be tested for impurities by colorimetric test in conformity with CSA test method 123.7-7A.
  - .3 Aggregate sizing shall conform to the CSA CAN3-A23.1, maximum aggregate size 20mm:

Sieve Size	% Passing by Weight
10 mm	100
5 mm	95 – 100
2.5 mm	80 – 100
1.25 mm	50 – 90
630 um	25 – 65
315 um	10 – 35
160 um	2 – 10
  - .4 Should the necessity for frequent rejections occur, no further sand will be accepted from that source and another approved source will be required.
- .3 Coarse Aggregate
  - .1 Coarse aggregate shall conform to the requirements of CSA CAN3-A23.1 except as modified by the following paragraphs:
  - .2 Coarse aggregate shall consist of gravel or broken stone composed of strong, hard, durable, uncoated pebbles, or rock fragments, washed clean and free from injurious amount of shale, coal, clay. Lumps, soft fragments, dirt, glass and organic or other deleterious substances.
  - .3 Aggregate sizing shall conform to CSA CAS3-A23.1 Section 5, Table 3 Group 1:

Sieve Size	% Passing by Weight
40 mm	100
28 mm	95 – 100
20 mm	85 – 95
14 mm	30 – 65
10 mm	25 – 60
5 mm	1 – 10
2.5 mm	0 – 5
  - .4 Aggregates shall be kept clean and free form all other materials during transportation and handling. The aggregates shall be kept separate from each other at the site, until measured and placed in the mixer.

## 2.3 PORTLAND CEMENT AND CONCRETE MATERIALS

### .1 General

- .1 Portland Cement shall conform to CSA-A5 for the following type;

Name	Type
Sulphate Resistant	50

- .2 The cement manufacturers mill test reports must be submitted to the Departmental Representative upon request.

### .2 Air Entraining Admixture

- .1 An air entraining admixture conforming to ASTM C260 must be added to the batch independently. Sufficient air entraining admixture shall be added to produce the air content specified at the time of placing in the forms, no additional payment will be made for the use of air entraining admixture.

### .3 Water Reducing Admixture

- .1 Water reducing admixture if approved shall conform to the requirements of ASTM C494. Before using a water reducing admixture the concrete supplier shall furnish evidence that it will be compatible with the brand of air entraining admixture he proposes to use. No additional payment will be made for the use of water reducing admixture.

### .4 Calcium Chloride Admixture

- .1 Calcium chloride conforming to ASTM C494 shall only be used when approved by the Departmental Representative but in no case will the amount added be greater than 2% of the cement weight. It shall not be used when the air temperature is above 4° C.

### .5 Use of Chemical Admixtures in Concrete

- .1 The use, chemical composition and classification of admixtures, the effect of admixtures and the application of admixtures for use in concrete shall be as detailed in ASTM C494. Use of chemical admixture must be approved by the Departmental Representative. No additional payment will be made for the use of chemical admixtures unless approved by the Departmental Representative.

### .6 Water

- .1 Water conforming to CSA CAN3-A23.1 to be used and shall be furnished from sources approved by the Departmental Representative. The Contractor shall make his own arrangements for the supply and payment of all water used on the Work.

### .7 Supplementary Cementing Materials

- .1 Pozzolanic mineral or fly ash shall conform to the requirements of CSA CAN3-A23.5, Supplementary Cementing Materials and their use in concrete construction.

### .8 Synthetic Reinforcing Fibers

- .1 Synthetic reinforcing fibers shall meet the following specification:

- .1 Fiber shall be polypropylene.
- .2 Fiber tensile strength shall be a minimum of 550 MPa.
- .3 Fiber content shall be a minimum of 1 kg/cubic meter.
- .4 Fiber length shall be the following:

Fiber Length	Aggregate Top Size
50 mm	40 mm
50 mm	25 mm
38 mm	15 mm

**2.4 CONCRETE MIX DESIGN**

- .1 An independent testing firm shall prepare concrete mix designs which will be submitted to the Departmental Representative for each source of concrete supply prior to the commencement of the contract. Concrete suppliers may submit their own mix designs provided they submit documentation to show that they have been approved by an independent testing firm.
- .2 Concrete supplied shall conform to the following minimum requirements:

**TABLE 1 – CONCRETE DESIGN REQUIREMENTS**

Concrete Strength (MPa)	Air Content (%)	Maximum Slump	Cement Type
30	6 – 8	80	Sulphate Resistant

**Part 3 Execution**

**3.1 SEASONAL AND COLD WEATHER REQUIREMENTS**

- .1 Seasonal and cold weather requirement shall conform to the requirements of CSA CAN3 A23.1 – 21.2.3 unless specified otherwise.
- .2 Concrete placed between April 16 and September 30 shall attain the minimum allowable compressive strength in 28 days. For concrete placed between October 1 and April 15, 85% of the minimum allowable compressive strength shall be attained in seven (7) days. The Departmental Representative will determine if high early strength concrete is required before September 30 based on the forecast weather conditions 48 hours prior to the placement of concrete.
- .3 When the air temperature is at or below 4° C or is likely to drop below 4° C within 24 hours of placing concrete, the temperature of the concrete immediately after being deposited in the forms is not less than 16° C nor more than 32° C. To accomplish this, the mixing water and if necessary the fine aggregates, shall be heated. Aggregates shall to be heated above 65° C and all frozen lumps of aggregate shall be excluded from the mix. When the exposure is severe either due to low air temperature, location of the work or thin sections of concrete, the temperature of the concrete shall approach the higher 32° C limit.

- .4 To avoid the possibility of flash set when either water or aggregate is heated to a temperature in excess of 38° C, water and aggregate shall come together first in the mixer in such a way that the temperature of the combination is reduced to below 38° C before cement is added. For mass concrete, the minimum temperatures stated above may be reduced at the discretion of the Departmental Representative.
- .5 Concrete to be broom finished with cut concrete jointing with a maximum 2000 x 2000 mm grid.

### **3.2 TESTING PROCEDURES AND SPECIFICATIONS**

- .1 Concrete supplied for this contract will be tested by the contractor through a recognized testing laboratory which will test according to CSA A23.2 testing procedures unless otherwise specified for the following:
  - .1 Methods of Tests for Concrete: CSA A23.2.
  - .2 Sampling of plastic concrete: CSA A23.2-1C.
  - .3 Making and curing concrete compressions and Flexural test specimen: CSA A23.2-3C.
  - .4 Air Content of plastic concrete by pressure method: CSA A23.2-4C.
  - .5 Slump of concrete: CSA A23.2-5C.
  - .6 Density, yield and cement factor of plastic concrete: CSA A23.2-6C.
  - .7 Compressive strength of cylindrical concrete specimens: CSA A23.2-9C.
- .2 Where reference is made to an ASTM designation or a CSA standard the current standard applies.
- .3 There shall be at least one strength test, slump test and air content test for each 50 cubic meters of concrete or fraction thereof.
- .4 When making tests on fresh concrete, not less than three specimens for each test shall be molded for compressive tests. One cylinder is to be tested at seven (7) days and two (2) at 28 days.
- .5 When the temperature is below 0° C during concrete placement or is likely to fall below minus 3C within 24 hours after a placement, two (2) additional cylinders will be made for each test. These two cylinders will be field cured in a manner that simulates curing of the concrete placed.
- .6 A minimum of two (2) field cured cylinders will be required for any cast in place concrete which is to be post tensioned.
- .7 The Contractor shall give the Departmental Representative 48 hours' notice prior to any concrete placement.
- .8 If testing indicates substandard materials and workmanship, further testing as approved by the Departmental Representative shall be completed at the Contractor's expense.

### **3.3 TESTING REPORTS**

- .1 Reports for concrete testing shall contain the following information:

- .1 Job to which concrete is being supplied
- .2 Date of sampling
- .3 Air temperature when sampling
- .4 Temperature of mix
- .5 Name of Supplier
- .6 Exact location in which the concrete is being placed
- .7 Specimen number
- .8 Test number
- .9 Slump
- .10 Age of Test
- .11 Cylinder Strength
- .12 Method of Curing
- .13 Air Content
- .14 Type of Cement

### **3.4 DEFECTIVE WORK**

- .1 Concrete is defective when:
  - .1 It fails to meet any requirement of this specification.
  - .2 Average of two (2), 28 day strength tests from one set of cylinders is less than the specified strength.
- .2 When concrete strength of any set of cylinders is greater than 85% but less than 100% of specified strength, price paid for work represented by deficient cylinders shall be determined as follows:

$$\text{Payment amount} = P \times (1 - 2(A-B))$$

Where P = unit price Tender for concrete work

A = Specified strength

B = Average of two cylinders 28 day strength

If strength is less than 85% of specified strength, concrete shall be removed and replaced at the Contractor's expense.

- .3 All concrete which fails to meet any requirement of this specification will be removed and replaced at the Contractor's expense.
- .4 The application of an adjusted unit price does not relieve the Contractor of the Contract maintenance requirements.

### **3.5 SUPPLY AND DELIVERY OF CONCRETE**

- .1 Mixing and Delivery
  - .1 Ready mixed concrete shall be mixed and delivered in accordance with the requirement of ASTM designation C-94, CSA A23.1.3 and subject to all

provisions herein relative to materials, strength proportioning, consistency, measurement and mixing unless noted otherwise.

- .2 If concrete placing is interrupted for a period of more than thirty (30) minutes, the work shall be removed back to the last surface cut and a construction joint shall be formed.

.2 Retempering

- .1 Concrete shall not be retempered if test values are within specification at the time of delivery to the site.
- .2 Concrete may be retempered at the job site with water and/or an air entraining admixture if the following requirements are met:
  - .1 Mixing time after the admixture or water has been introduced shall not be less than five minutes at mixing speed.
  - .2 Total mixing and agitating time for the load shall not exceed 90 minutes or 300 revolutions of the drum.

**END OF SECTION**

Approved: 2009-12-31

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 01 33 00 - Submittal Procedures.
- .2            Section 31 11 42 - Granular Road Structure
- .3            Section 31 17 26 - Roadway Excavation, Backfill and Subgrade Preparation

**1.2                MEASUREMENT AND PAYMENT**

- .1            50mm Depth Crushed Stone Paving:
  - .1            Measurement: Measurement shall be made by field measurement of work completed in square meters.
  - .2            Payment: The price shall include excavation, sub grade preparation, supply of gravel base, hauling, loading and unloading, and installation of 10mm crushed gravel, grading of gravel, and compaction and all work and materials incidental thereto.
- .2            Gravel Walking Trail:
  - .1            Measurement: Measurement shall be made by field measurement of work completed in square meters.
  - .2            Payment: The price shall include excavation, sub grade preparation, supply of gravel base, hauling, loading and unloading, and installation of 10mm crushed gravel, grading of gravel, and compaction and all work and materials incidental thereto.
- .3            150mm Depth Gravel Base:
  - .1            Measurement: Measurement shall be made by field measurement of work completed in square meters.
  - .2            Payment: The price shall include excavation, sub grade preparation, supply of gravel base, hauling, loading and unloading, and installation of 20mm crushed gravel, grading of gravel, and compaction and all work and materials incidental thereto.
- .4            Utility Pod Gravel:
  - .1            Measurement: Measurement shall be made by field measurement of work completed in square meters.
  - .2            Payment: The price shall include excavation, sub grade preparation, supply of gravel base, hauling, loading and unloading, and installation of 20mm crushed gravel, grading of gravel, and compaction and all work and materials incidental thereto.
- .5            Rip Rap Channel:
  - .1            Measurement: Measurement shall be made by field measurement of work completed in square meters.

- .2 Payment: The price shall include excavation, sub grade preparation, supply of geotextile, hauling, loading and unloading, and installation of 150-450mm dia rock, hand placement if required to achieve uniform appearance, grading of gravel, and all work and materials incidental thereto.
- .3

### 1.3 REFERENCES

- .1 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 D4318-[05], Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
  - .4 ASTM D698-[07e1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 600 kN-m<sup>3</sup>.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

### 1.4 DELIVERY, STORAGE AND HANDLING

- .1 Store crushed stone as and where directed by Department Representative.

## Part 2 Products

### 2.1 MATERIALS

- .1 Rip Rap Channel:
  - .1 150-450mm Fieldstone or washed river rock. Crushed stone is not acceptable.
  - .2 Nilex 4545 non woven geotextile.
- .2 20mm Gravel granular base: in accordance with Section 31 11 42 Granular Road Structure and following requirements:
  - .1 Crushed stone or gravel: hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
- .3 10mm Crushed Gravel:
  - .1 Screenings: hard, durable, crushed stone particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
  - .2 Optimum Moisture Content: 7.5%
  - .3 Grain Size Distribution:
    - Gravel – 21.8%
    - Sand – 61.5%
    - Silt – 12.8%
    - Clay – 3.9%
  - .4 Gradations: within limits specified when tested to ASTM C136.

Sieve Designation	% Passing
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16	100
12.5	98 – 100
10	80 – 98
5	55 – 80
2.5	40 – 60
1.25	35 – 50
0.63	28 – 43
0.315	23 – 36
0.160	15 – 25
0.080	8 - 18

**Part 3 Execution**

**3.1 SUBGRADE**

- .1 Ensure subgrade preparation conforms to levels and compaction required, to allow for installation of granular base.

**3.2 10mm Crushed Gravel**

- .1 Place granular topping to compacted thickness 50mm minimum.
- .2 Place material in uniform layers not to exceed 100 mm compacted thickness.
  - .1 Compact layer to 95 % Standard Density in accordance with ASTM D698.
- .3 The gravel trail mix must be laid upon a dry firm sub-grade, true to grade and cross-section and free from all screening or other loose or foreign material. No gravel trail mix to be installed when the sub-grade is wet or when other conditions prevent proper spreading, finishing or compaction of the gravel trail mix.

**3.3 FIELD QUALITY CONTROL**

- .1 Inspection and testing of crushed stone paving: carried out by designated testing laboratory.
- .2 Costs of tests: paid by owner.

**3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section [01 74 11 - Cleaning].
  - .1 Leave Work area clean at end of each day.

**3.5 PROTECTION**

- .1 Prevent damage to natural features outside of the project area.
  - .1 Repair damages incurred.

**END OF SECTION**



**Part 1            General**

**1.1                SECTION INCLUDES**

- .1        Materials and installation of standard manufactured catalogue items such as waste containers, benches, tables, campsite furnishings.
- .2        Constructed small structures made using standard building techniques.

**1.2                RELATED SECTIONS**

- .1        Section 01 33 00 - Submittal Procedures.
- .2        Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3        Section 01 78 00 - Closeout Submittals.
- .4        Section 31 11 42 - Granular Road Structure

**1.3                SUBMITTALS**

- .1        Submit samples of paint colours for all products and materials. Client to be provided a minimum of 7 days to review paint colours.
- .2        Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .3        Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .4        Indicate dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.
- .5        Provide maintenance data for care and cleaning of site furnishings for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

**1.4                MEASUREMENT AND PAYMENT**

- .1        Water Station:
  - .1        Measurement: Measurement shall be made by count of number installed on site.
  - .2        Payment: The price shall include supply and installation of structure, shop drawings, sink, grey water system, connection to water system and all work and materials incidental thereto.
- .2        Entry Kiosk:
  - .1        Measurement: Measurement shall be made by count of number installed on site.
  - .2        Payment: The price shall include shop drawings, supply and installation of all work and materials incidental thereto, with the exclusion of the signage element. Signage will be supplied and installed by Parks Canada staff.
- .3        Moveable Picnic Table:
  - .1        Measurement: Measurement shall be made by count of number installed on site.

- .2 Payment: The price shall include supply and installation of all work and materials incidental thereto.
- .4 Fire Pits:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of all work and materials incidental thereto.
- .5 Campsite Marker:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of all work and materials incidental thereto.
- .6 Waste - Recycle Container:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of all work and materials incidental thereto.
- .7 Entry Gate:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of all work and materials incidental thereto.
- .8 Wood Bollard:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of all work and materials incidental thereto.
- .9 Grey Water Station:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include shop drawings, supply and installation of all work and materials incidental thereto.
- .10 Living Area Edger:
  - .1 Measurement: Measurement shall be made by the linear meters installed on site.
  - .2 Payment: The price shall include supply and installation of wood, rebar, excavation, and back filling and all work and materials incidental thereto.
- .11 Utility Pod Edger:
  - .1 Measurement: Measurement shall be made by the linear meters installed on site.
  - .2 Payment: The price shall include supply and installation of wood, rebar, excavation, and back filling and all work and materials incidental thereto.
- .12 Vehicular Directional Sign:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of post and sign, drilling of hole, concrete backfill, all work and materials incidental thereto.
- .13 Multiflow Discharge System:

- .1 Measurement: Measurement shall be made by the linear meters installed on site. No distinction shall be made of the type of pipe.
  - .2 Payment: The price shall include supply and installation of Multiflow pipe, weeping tile, all connections, drilling of hole, concrete backfill, all work and materials incidental thereto.
- .14 Wood Storage Bin:
- .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of gravel pad, precast concrete, eye bolts and all work and materials incidental thereto.

## **Part 2 Product**

### **2.1 Living Area Edger:**

- .1 Acceptable Lumber Materials in Contact with Ground:
  - .1 Use Code: 4.1
  - .2 Product Group: D
  - .3 Lumber: SPF
  - .4 Preservative: CA
  - .5 Method: Incised
- .2 10M rebar cut to suitable length.

### **2.2 Utility Pod Edger:**

- .1 Acceptable Lumber Materials in Contact with Ground:
  - .1 Use Code: 4.1
  - .2 Product Group: D
  - .3 Lumber: SPF
  - .4 Preservative: CA
  - .5 Method: Incised
- .2 10M rebar cut to suitable length.

### **2.3 Vehicular Directional Sign:**

- .1 Standard traffic signage such as stop signs and speed limits.
  - .1 Sign Size: 45cm x 45cm min.
  - .2 Reflective Sheeting: 3M High Intensity Grade
  - .3 Panel Type: Aluminum (0.081" Flat Sheet)

### **2.4 Water Station**

- .1 Acceptable Lumber Materials in Contact with Ground:
  - .1 Use Code: 4.1
  - .2 Product Group: D

- .3 Lumber: SPF
- .4 Preservative: CA
- .5 Method: Incised
- .2 Acceptable Lumber Materials not in Contact with Ground:
  - .1 Use Code: 3.2
  - .2 Product Group: C
  - .3 Lumber: SPF
  - .4 Preservative: CA
  - .5 Method: Non incised
- .3 Metal Wall System:
  - .1 Prefinished Wall Sheet, exposed to exterior.
    - .1 Profile: Tradition 100-4, with I-style ribs at 400 mm spacing.
    - .2 Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76mm (0.030").
  - .2 Clip System:
    - .1 Thermally responsive clips to be fabricated from a minimum of 0.91 mm (.036") steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.
    - .2 Wall Fasteners: As specified by manufacturer.
  - .3 Snap Cap:
    - .1 Provide 25 mm high snap caps for full length of the panel and retained by panel clips, fabricated from Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a minimum nominal core thickness 0.61mm (0.024"). Finish and colour to match sheet.
  - .4 Accessories:
    - .1 Flashing: In accordance with Section 07 62 00. Formed from same materials as the roof sheet. Custom fabricated to suit Departmental Representativeural details, as required.
    - .2 Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.
    - .3 Sealants: In accordance with manufacturer's recommendation.
- .4 Metal Roof System: Tradition100-4 on Solid Substrate by Vicwest.
  - 1. Underlayment: Membrane shall be Lastobond by Soprema or Ice and Water Shield by W.R. Grace or an approved type to meet performance specified in Section 07 13 00.
  - 2. Clip System:
    - a. Thermally responsive clips to be fabricated from a minimum of 0.91 mm (.036") steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.
    - b. Roof Fasteners: As specified by manufacturer, to resist wind uplift and sliding snow forces.
  - 3. Prefinished Roof Sheet, exposed to exterior.
    - a. Profile: Tradition 100-4, with I-style ribs at 400 mm spacing.

- b. Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76mm (0.030”).
- 4. Snap Cap:
  - a. Provide 25 mm high snap caps for full length of the roof panel and retained by panel clips, fabricated from Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a minimum nominal core thickness 0.61mm (0.024”). Finish and colour to match roof sheet.
- 5. Accessories:
  - a. Flashing: In accordance with Section 07 62 00. Formed from same materials as the roof sheet. Custom fabricated to suit Departmental Representative details, as required.
  - b. Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.
  - c. Sealants: In accordance with manufacturer's recommendation.
- .5 Wood Siding: Pre-finished Lap Siding: Hardboard siding, to CAN/CGSB11.5-M87.
  - .1 Factory Finished: Type 5, high density hardboard siding with deeply textured surface and baked-on finish coat; fastening-spline for interlocking system, self-aligning.
  - .2 Size and Exposure: 152 mm wide x 9mm thick x 3658mm or 4877mm long; exposure 119mm.
  - .3 Overlap: 29mm.
  - .4 Fastening system: hidden nail assembly.
  - .5 Texture: Embossed cedar wood grain.
  - .6 Colour: dark grey type upon approval of departmental representative.
  - .7 Accessories: Recommend by siding manufacturer to match siding
    - .1 Prefabricated continuous outside and inside corner trim.
    - .2 Prefabricated starter strips.
    - .3 Prefabricated joint mouldings.
    - .4 Thermoplastic caulk.
    - .5 Prefabricated drip cap.
    - .6 Coloured nails.
    - .7 J-molding
    - .8 Touch-up paint.
- .6 Corner Trim: LP® SmartSide® 5/4" x 4" x 10' Textured Engineered Wood Outside Corner Trim - pre-primed - paint, exterior grade, colour to match siding.
- .7 Inside Corners and Jambs (j-mold) use: continuous preformed vinyl moulding - colour to match siding.
- .8 Stainless Steel Sink and Faucet
  - .1 Acceptable Stainless Steel Sink Product: Tarrison Products – Corner Drain Sink CDS1-24LR
  - .2 Frame: Stainless Steel

- .3 Dimensions: 60"x30"x45"
- .9 Acceptable Faucet Product: Tarrison Products – Heavy Duty Wall Mount Facet 805003B
  - .1 Frame: Brass construction and polished chrome body
  - .2 Dimensions: 81/2" Gooseneck
- .10 Concrete:
  - .1 Class: C2
  - .2 Strength: Min. 32MPa, 28d, 5-8% air
  - .3 Max W/CM: 0.45
  - .4 Standards: CSA A23.1/ Concrete Materials and Methods of Construction
- .11 Catch Basin: Aco F660 Catch Basin with Galvanized Steel Frame
  - .1 Product: 97425
  - .2 Dimensions: 391mm x 622mm x 676mm
  - .3 Grate: F660 Bar Galvanized Steel Grate
- .12 Drywell:
  - .1 600mm diameter Galvanized Metal Culvert
  - .2 Nillex 4545 geotextile
  - .3 100mm Washed rock
  - .4 600mm diameter raw steel lid with 50mm lip
  - .5 Pipe: 100mm solid PVC pipe
  - .6

## 2.5 Entry Kiosk

- .1 Acceptable Lumber Materials in Contact with Ground:
  - .1 Use Code: 4.1
  - .2 Product Group: D
  - .3 Lumber: SPF
  - .4 Preservative: CA
  - .5 Method: Incised
- .2 Acceptable Lumber Materials not in Contact with Ground:
  - .1 Use Code: 3.2
  - .2 Product Group: C
  - .3 Lumber: SPF
  - .4 Preservative: CA
  - .5 Method: Non incised
- .3 Metal Wall System:
  - .1 Prefinished Wall Sheet, exposed to exterior.
    - .1 Profile: Tradition 100-4, with I-style ribs at 400 mm spacing.

- .2 Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76mm (0.030”).
- .2 Clip System:
  - .1 Thermally responsive clips to be fabricated from a minimum of 0.91 mm (.036") steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.
  - .2 Wall Fasteners: As specified by manufacturer.
- .3 Snap Cap:
  - .1 Provide 25 mm high snap caps for full length of the panel and retained by panel clips, fabricated from Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a minimum nominal core thickness 0.61mm (0.024”). Finish and colour to match sheet.
- .4 Accessories:
  - .1 Flashing: In accordance with Section 07 62 00. Formed from same materials as the roof sheet. Custom fabricated to suit Departmental Representativeural details, as required.
  - .2 Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.
  - .3 Sealants: In accordance with manufacturer's recommendation.
- 4 Metal Roof System: Tradition100-4 on Solid Substrate by Vicwest.
  1. Underlayment: Membrane shall be Lastobond by Soprema or Ice and Water Shield by W.R. Grace or an approved type to meet performance specified in Section 07 13 00.
  2. Clip System:
    - a. Thermally responsive clips to be fabricated from a minimum of 0.91 mm (.036") steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.
    - b. Roof Fasteners: As specified by manufacturer, to resist wind uplift and sliding snow forces.
  3. Prefinished Roof Sheet, exposed to exterior.
    - a. Profile: Tradition 100-4, with I-style ribs at 400 mm spacing.
    - b. Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76mm (0.030”).
  4. Snap Cap:
    - a. Provide 25 mm high snap caps for full length of the roof panel and retained by panel clips, fabricated from Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a minimum nominal core thickness 0.61mm (0.024”). Finish and colour to match roof sheet.
  5. Accessories:
    - a. Flashing: In accordance with Section 07 62 00. Formed from same materials as the roof sheet. Custom fabricated to suit Departmental Representativeural details, as required.
    - b. Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.
    - c. Sealants: In accordance with manufacturer's recommendation.

- .5 Wood Siding: Pre-finished Lap Siding: Hardboard siding, to CAN/CGSB11.5-M87.
  - .1 Factory Finished: Type 5, high density hardboard siding with deeply textured surface and baked-on finish coat; fastening-spline for interlocking system, self-aligning.
  - .2 Size and Exposure: 152 mm wide x 9mm thick x 3658mm or 4877mm long; exposure 119mm.
  - .3 Overlap: 29mm.
  - .4 Fastening system: hidden nail assembly.
  - .5 Texture: Embossed cedar wood grain.
  - .6 Colour: dark grey type upon approval of departmental representative.
  - .7 Accessories: Recommend by siding manufacturer to match siding
    - .1 Prefabricated continuous outside and inside corner trim.
    - .2 Prefabricated starter strips.
    - .3 Prefabricated joint mouldings.
    - .4 Thermoplastic caulk.
    - .5 Prefabricated drip cap.
    - .6 Coloured nails.
    - .7 J-molding
    - .8 Touch-up paint.
- .6 Corner Trim: LP® SmartSide® 5/4" x 4" x 10' Textured Engineered Wood Outside Corner Trim - pre-primed - paint, exterior grade, colour to match siding.
- .7 Inside Corners and Jambs (j-mold) use: continous preformed vinyl moulding - colour to match siding.
- .8 Concrete:
  - .1 Class: C2
  - .2 Strength: Min. 32MPa, 28d, 5-8% air
  - .3 Max W/CM: 0.45
  - .4 Standards: CSA A23.1/ Concrete Materials and Methods of Construction

## **2.6 Moveable Picnic Table**

- .1 Acceptable Product: Series BR Picnic Table by Custum Park and Leisure
  - .1 Recycled Material with steel frame
  - .2 Wheelchair Accessible style
  - .3 Colour: Winchester Grey with Black frame

## **2.7 Fire Pits**

- .1 Acceptable Material: Steel
  - .1 All steel to have a grade of steel to have a grade of ASTM-A36, CSA G40.21-44W or better or latest edition.
  - .2 All welding shall conform to current CSA W59 or latest edition.

- .3 All welds to be continuous.
- .4 All rough, sharp or hazardous edges to be ground smooth or rounded.
- .5 Dimensions: 600mm Dia x 600mm depth

## **2.8 Campsite Marker**

- .1 Acceptable Product: Astrographic Industries Ltd. – Fren\_006
  - .1 Width x Height: 102mm x 1676mm
  - .2 Background Colour: Custom Grasslands Beige – Contractor to coordinate custom painting with supplier.
  - .3 Substrate: Carsonite
  - .4 Print Colour: Avery Black Vinyl
  - .5 Sign Hardware: Clip

## **2.9 Waste - Recycle Container**

- .1 Acceptable Product: Haul All - Hid-A-Bag™ II Combo Waste & Recycle Container
  - .1 Options included: Pre Cast Mounting Pad (HB11-572), 5” Recycling Hood, Recycling Logo Decal.
  - .2 Weight: 405kg

## **2.10 Entry Gate**

- .1 Acceptable Product: Custom Park and Leisure Ltd. – Emergency/Maintenance Gate Series A Double Swing Gate
  - .1 Frame: Steel
  - .2 Finish: Powder Coated
  - .3 Colour: Brown (to be verified prior to painting by contractor)

## **2.11 Wood Bollard**

- .1 Acceptable Lumber Materials:
  - .1 Use Code: 4.1
  - .2 Product Group: D
  - .3 Lumber: SPF
  - .4 Preservative: CA
  - .5 Method: Incised

## **2.12 Grey Water System**

- .1 Concrete:
  - .1 Class: C2
  - .2 Strength: Min. 32MPa, 28d, 5-8% air
  - .3 Max W/CM: 0.45
  - .4 Standards: CSA A23.1/ Concrete Materials and Methods of Construction
- .2 Catch Basin: Aco F660 Catch Basin with Galvanized Steel Frame

- .1 Product: 97425
- .2 Dimensions: 391mm x 622mm x 676mm
- .3 Grate: F660 Bar Galvanized Steel Grate
- .3 Drywell:
  - .1 600mm diameter Galvanized Metal Culvert
  - .2 Nilex 4545 geotextile
  - .3 100mm Washed rock
  - .4 600mm diameter raw steel lid with 50mm lip
  - .5 Pipe: 100mm solid PVC pipe

**2.13 Multiflow Discharge System:**

- .1 12" Multiflow Pipe, couplers, horizontal connectors, end caps and all other pieces and products required to assemble the system.
- .2 Provide at least 2 inspection ports in the system at locations approved by Parks Representative.
- .3 Flexible 4" Non Perforated weeping tile drain pipe.

**2.14 Wood Storage Bin:**

- .1 Acceptable Product: Redi – Rock
  - .1 Galvanized 50mm eye bolts
  - .2 20mm Crushed Gravel

**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Assemble furnishings in accordance with manufacturer's instructions.
- .2 Install furnishing true, plumb, anchored, and firmly supported, as indicated.
- .3 Touch-up damaged finishes to approval of Parks Representative.

**END OF SECTION**

## **Part 1 General**

### **1.1 SUMMARY**

- .1 Section Includes:
  - .1 Materials and installation for plant material, accessories, planting, tree support, mulching and maintenance.
- .2 Related Sections:
  - .1 Section 32 91 19.13 - Topsoil Placement and Grading.

### **1.2 REFERENCES**

- .1 Agriculture and Agri-Food Canada (AAFC).
  - .1 Plant Hardiness Zones in Canada-[2000].
- .2 Canadian Nursery Landscape Association (CNLA).
  - .1 Canadian Standards for Nursery Stock-[2001].
- .3 Department of Justice Canada (Jus).
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
  - .2 Transportation of Dangerous Goods Act (TDGA), 1992, c.34.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).

### **1.3 DEFINITIONS**

- .1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

### **1.4 SUBMITTALS**

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data for:
  - .1 Fertilizer.
  - .2 Mulch.
- .3 Submit samples for:
  - .1 Mulch.

### **1.5 MEASUREMENT AND PAYMENT**

- .1 Shrubs:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of all work and materials incidental thereto.

- .2 Woodchip Mulch:
  - .1 Measurement: Measurement shall be made by count of number installed on site.
  - .2 Payment: The price shall include supply and installation of all work and materials incidental thereto.
  - .3

## **1.6 QUALITY ASSURANCE**

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

## **1.7 STORAGE AND PROTECTION**

- .1 Protect plant material from frost, excessive heat, wind and sun during delivery.
- .2 Immediately store and protect plant material which will not be installed within 12 hours after arrival at site in storage location approved by Parks Representative.
- .3 Protect plant material from damage during transportation:
  - .1 When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
  - .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
  - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .4 Protect stored plant material from frost, wind and sun and as follows:
  - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.
  - .2 For pots and containers, maintain moisture level in containers.
  - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

## **1.8 SCHEDULING**

- .1 Obtain approval from Parks Representative of schedule 7 days in advance of shipment of plant material.
- .2 Schedule to include:
  - .1 Quantity and type of plant material.
  - .2 Shipping dates.
  - .3 Arrival dates on site.
  - .4 Planting Dates.

## **1.9 WARRANTY**

- .1 There shall be no warranty for plant material.

**1.10 MAINTENANCE**

- .1 Contractor shall maintain plant material until construction completion.
- .2 There shall be no maintenance of plant material during warranty period.

**Part 2 Products**

**2.1 PLANT MATERIAL**

- .1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
  - .1 Source of plant material: grown in Zone 4A or 5 in accordance with Plant Hardiness Zones in Canada.
  - .2 Plant material must be planted in zone indicated as appropriate for its species.
  - .3 Plant material in location appropriate for its species.
- .2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- .3 Trees: with straight trunks, well and characteristically branched for species except where specified otherwise.

**2.2 WOODCHIP MULCH**

- .1 Wood chip: varying in size, free of bark, small branches and leaves.

**2.3 WATER**

- .1 Free of impurities that would inhibit plant growth.

**2.4 FERTILIZER**

- .1 Synthetic commercial type as recommended by soil test report.

**2.5 SOURCE QUALITY CONTROL**

- .1 Obtain approval from Department Representative of plant material prior to planting.
- .2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

**Part 3 Execution**

**3.1 PRE-PLANTING PREPARATION**

- .1 Ensure plant material acceptable to Parks Representative.
- .2 Remove damaged roots and branches from plant material.

### **3.2 EXCAVATION AND PREPARATION OF PLANTING BEDS**

- .1 Preparation of planting beds is specified in Section 32 91 19.13 - Topsoil Placement and Grading.
- .2 For planting bed layout:
  - .1 Stake out location and obtain approval from Parks Representative prior to planting.

### **3.3 PLANTING**

- .1 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .2 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
- .3 For trees and shrubs:
  - .1 Backfill soil in 150 mm lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
  - .2 Form watering saucer as indicated.
- .4 Water plant material thoroughly.
- .5 After soil settlement has occurred, fill with soil to finish grade.
- .6 Dispose of burlap, wire and container material off site.

### **3.4 MULCHING**

- .1 Ensure soil settlement has been corrected prior to mulching.
- .2 Spread mulch evenly and remove from base of shrubs.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1        Section 01 33 00 - Submittal Procedures.
- .2        Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3        Section 01 78 00 - Closeout Submittals.
- .4        Section 31 11 42 - Granular Road Structure
- .5        Section 32 93 10 – Trees, Shrubs and Ground Cover Planting

**1.2                MEASUREMENT PROCEDURES**

- .1        Imported Topsoil Placement and Fine Grading:
  - .1        Measurement: Measurement shall be made by field measurement of work completed in square meters.
  - .2        Payment: The price shall include sub grade preparation, supply of topsoil, hauling, loading and unloading, and installation of topsoil, fine grading of topsoil, and compaction and all work and materials incidental thereto.
- .2        Insitu Topsoil Placement and Fine Grading:
  - .1        Measurement: Measurement shall be by truck count in cubic meters.
  - .2        Payment: The price shall include sub grade preparation, hauling, loading and unloading, and installation of topsoil, fine grading of topsoil, and compaction and all work and materials incidental thereto.
- .3        Planting Beds:
  - .1        Measurement: Measurement shall be made by field measurement of work completed in square meters.
  - .2        Payment: The price shall include excavation of beds, disposal of material excavated, sub grade preparation, supply of topsoil, hauling, loading and unloading, and installation of topsoil, fine grading of topsoil, and compaction and all work and materials incidental thereto.

**1.3                PAYMENT PROCEDURES**

- .1        Testing of topsoil: Contractor will pay for cost of testing topsoil.

**1.4                REFERENCES**

- .1        Agriculture and Agri-Food Canada
  - .1        The Canadian System of Soil Classification, Third Edition, 1998.
- .2        Canadian Council of Ministers of the Environment
  - .1        PN1340-[2005], Guidelines for Compost Quality.
- .3        Canadian Green Building Council (CaGBC)

- .1 LEED Canada-NC Version 1.0-[December 2004], LEED (Leadership in Energy and Environmental Design): Green Building Rating System For New Construction and Major Renovations.
- .4 U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

## **1.5 TESTING OF TOPSOIL**

- .1 Testing of topsoil: Contractor will pay the cost of testing topsoil.
- .2 The contractor shall test the topsoil for the following.
  - .1 Weed seed count test
  - .2 Basic soil fertility and nutrient analysis, including but not limited to Salinity (Detailed & Basic), pH, Conductivity, Particle Size (Sieve, Hydrometer, Pipette, ASTM 422-63), Organic Matter, Cation Exchange Capacity, Nitrogen, and Sulphur.
  - .3 Fertilizer recommendations.
- .3 In this specification, a range of measurable physical and chemical properties is set out as acceptable in a growing medium. Compliance with the specification is to be determined by testing for those properties. When imported or on-site soil is used, it shall be tested and modified as necessary by the admixture of other components and amendments to bring the properties within appropriate ranges, unless otherwise specified.
- .4 All testing shall only be performed by an accredited commercial lab in Saskatchewan.
- .5 When on-site soil is to be used, the topsoil shall be tested. Where test results indicate that modifications are required to the on-site soil, these should be incorporated as part of the bid documents.
- .6 Failure to test and provide appropriate documentation of test results may be considered grounds for rejection of a proposed growing medium and removal of such material at the contractor's expense.
- .7 When this Guideline is adopted as part of a contract, or when the contract requires testing of growing medium and its components, the contractor shall meet all requirements of this section, or the corresponding specifications of the contract. The contractor's signature to the contract shall signify that the contractor has read and fully understands the requirements for growing medium and testing.
- .8 The contractor shall guarantee that the soil submitted for laboratory testing is a representative sample taken (according to the lab recommendations) from the soil that will be delivered to the site.

## **1.6 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality control submittals :

- .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

### **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

## **Part 2 Products**

### **2.1 TOPSOIL**

- .1 Topsoil acceptance shall be at the sole discretion of the Departmental Representative.

### **2.2 SOURCE QUALITY CONTROL**

- .1 Testing of topsoil will be carried out by testing laboratory designated by Parks Representative.
  - .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

## **Part 3 Execution**

### **3.1 PREPARATION OF EXISTING GRADE**

- .1 Verify that grades are correct.
  - .1 If discrepancies occur, notify Parks Representative and do not commence work until instructed Parks Representative.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Cultivate entire area which is to receive topsoil to minimum depth of 150 mm.
  - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

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

- .1 Place topsoil after Parks Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 Spread topsoil as indicated to following minimum depths after settlement.
  - .1 100 mm for seeded areas.
  - .2 300mm for planting beds.
- .4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

**3.3 FINISH GRADING**

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
  - .1 Prepare loose friable bed by means of cultivation and subsequent raking.

**3.4 ACCEPTANCE**

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

**3.5 SURPLUS MATERIAL**

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

**3.6 CLEANING**

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

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1            Section 01 33 00 - Submittal Procedures.
- .2            Section 32 91 19.13 - Topsoil Placement and Grading.

**1.2                MEASUREMENT PROCEDURES**

- .1            Hydraulic Seeding:
  - .1            Measurement: Measurement shall be made by field measurement of work completed in square meters. Areas of blending into existing turf grass will not be measured for payment.
  - .2            Payment: The price shall include seed, mulch, tackifier, water, hauling, loading and unloading, and installation and all work and materials incidental thereto.

**1.3                MAINTENANCE PLAN**

- .1            Contractor to provide a detailed maintenance plan indicating how weeds will be monitored and treated.

**1.4                SUBMITTALS**

- .1            Product Data.
  - .1            Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
  - .2            Provide product data for:
    - .1            Seed.
    - .2            Mulch.
    - .3            Tackifier.
    - .4            Fertilizer.
  - .3            Submit in writing to Parks representative 14 days prior to commencing work:
    - .1            Volume capacity of hydraulic seeder in litres.
    - .2            Amount of material to be used per tank based on volume.
    - .3            Number of tank loads required per hectare to apply specified slurry mixture per hectare.

**1.5                QUALITY ASSURANCE**

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

## **1.6 SCHEDULING**

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

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
  - .1 Grass mixture: "Certified", "Canada No. [1] [2 ] Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".
    - .1 Mixture composition:
      - .1 20% Western Wheatgrass
      - .2 20% June Grass
      - .3 15% Bluegrass
      - .4 15% W. Porcupine
      - .5 15% Needle and Thread Grass
      - .6 15% Blue Grama
  - .2 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
    - .1 Type I mulch:
      - .1 Nilex MulchMax101wood
  - .3 Tackifier: water soluble vegetable carbohydrate powder.
  - .4 Water: free of impurities that would inhibit germination and growth.
  - .5 Fertilizer:
    - .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
    - .2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.
  - .6 Inoculants: inoculant containers to be tagged with expiry date.

## **Part 3 Execution**

### **3.1 WORKMANSHIP**

- .1 Do not spray onto structures, signs, guide rails, fences, plant material, utilities and other than surfaces intended.

- .2 Clean-up immediately, any material sprayed where not intended, to satisfaction of Parks Representative.
- .3 Do not perform work under adverse field conditions such as wind speeds over 10km/h, frozen ground or ground covered with snow, ice or standing water.
- .4 Provide signage to identify what areas have been seeded and advise people to stay off.

### **3.2 PREPARATION OF SURFACES**

- .1 Fine grade areas to be seeded free of humps and hollows. Ensure areas are free of deleterious and refuse materials.
- .2 Obtain Parks Representative approval of grade and topsoil depth before starting to seed.

### **3.3 HYDRAULIC SEEDING APPLICATION**

- .1 Hydraulic seeding as per manufacturer's recommendation.

### **3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD**

- .1 Perform following operations from time of seed application until acceptance by Departmental Representative.
- .2 Grass Mixture:
  - .1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
  - .2 Mow grass at least once per month. Remove clippings which will smother grass.
  - .3 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.
  - .4 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

### **3.5 ACCEPTANCE**

- .1 Seeded areas will be accepted by Parks Representative provided that:
  - .1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.
  - .2 Areas seeded are free from weeds.
- .2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

### **3.6 MAINTENANCE DURING WARRANTY PERIOD**

- .1 Contractor is required to ensure germination of grass.
- .2 Removal of weeds during maintenance period.
- .3 Periodic cutting as required for best establishment.

**3.7 CLEANING**

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

**END OF SECTION**

**Part 1 General**

**1.1 DESCRIPTION**

- .1 This section specifies requirements for supplying and installing pressure water main HDPE pipe and appurtenances.

**1.2 RELATED SECTIONS**

- .1 Section 31 23 33.01 Excavating, Trenching and Backfilling

**1.3 SCHEDULING OF WORK**

- .1 Contractor to schedule work to minimize interruptions to existing services within Grasslands National Park.
- .2 The Contractor shall submit a schedule of expected interruptions for approval by the Departmental Representative.

**1.4 MEASUREMENT PROCEDURES**

- .1 **“Water Mains supply and install – 75mm HDPE DR 11”**, to be paid for per linear meter. All bends, plugs, tees, reducers and other appurtenances are incidental to the 75mm HDPE water main installation work. Price shall be full compensation for all necessary work for the supply and installation of water mains, including pipe laying, jointing/fusing, thrust blocking, testing, flushing, cathodic protection, disinfection and marker posts as depicted on the drawings.
- .2 **“Water Mains supply and install – 25mm HDPE DR 11”**, to be paid for per lineal meter. All bends, tees, reducers and other appurtenances are incidental to the 25mm HDPE water main installation work. Price shall be full compensation for all necessary work for the supply and installation of water mains, including pipe laying, jointing/fusing, thrust blocking, testing, flushing, cathodic protection and disinfection.
- .3 **“Watermain gate valve for 75mm main”**, to be paid for per unit supplied and installed, including backfilling, cathodic protection, operating rod, valve box assembly, valve lid and all necessary connections to the water main.
- .4 **“Watermain curb stop valve for 25mm main”**, to be paid for per unit supplied and installed, including backfilling, cathodic protection, operating rod, valve box assembly, valve lid and all necessary connections to the water main.
- .5 Trench excavation compaction and backfill to be installed as per Section 31 23 33.01. No additional payment will be made for Trench excavation, compaction and backfill. Costs associated with this item should be built into the linear meter rate of the pipe installed.

**Part 2**

**Products**

**2.1 PIPE**

- .1 High Density Polyethylene Pipe (HDPE) 25mm and 75mm in diameter for potable water use DR 11 with a pressure class of 200 PSI (or approved equivalent). HDPE pipe will conform to AWWA C906-99 standard and shall be PE 4710.

**2.2 PIPE JOINTS**

- .1 High Density Polyethylene Pipe joints, bends, tees will be fused as per manufacturers specifications by a certified personnel.

**2.3 FITTINGS**

- .1 High Density Polyethylene Pipe joints, bends, tees will be fused as per manufacturers specifications by a certified personnel.

**2.4 VALVES AND VALVE BOXES**

- .1 75mm HDPE mainline valves are to be Victaulic Series 772H NRS Groove x Groove gate valves (or approved equivalent) with a Victaulic Coupling for HDPE-to-steel pipe, style 907.
- .2 25mm HDPE spigot service curb stop to be “Ball Valve Curb Stop – B77-444-NL style” from the Ford meter box company (or approved equivalent).
- .3 Both valves types are to be fitted with top and bottom valve box and casing assemblies complete with operating rod and valve box lid adjustable to the approximate 1.5m design depth of the water mains.

**2.5 SUBSURFACE PROTECTION**

- .1 Denso tape or approved equivalent.
- .2 Install sacrificial Anode as per manufacturer’s specifications (2.3 kg anode).

**2.6 SURFACE PROTECTION**

- .1 A marker post (100 x 100 mm) of pressure treated SPF post is to be installed at the two plug locations as shown on drawing C1.1. Post should be installed at the end of the HDPE pipe plug and extend 0.5m above the final surface grade for ease of future locating.

**2.7 PIPE DISINFECTION**

- .1 All water mains and appurtenances shall be disinfected under supervision of the Departmental Representative in accordance with the latest version of AWWA C651, “Disinfecting Water Mains”.

**Part 3 Execution**

**3.1 PREPARATION**

- .1 Clean pipes, fittings, valves, and appurtenances of accumulated debris and water before installation. Carefully inspect materials for defects. Mark and remove defective materials from site.

**3.2 TRENCHING, BEDDING AND BACKFILL**

- .1 Trenching, Bedding and Backfill shall be in accordance with Section 31 23 33.01.
- .2 Trench alignment and depth shall be in accordance with the drawings or as approved by the Departmental Representative.
- .3 Do not backfill trenches until installed work has been inspected and approved by the Departmental Representative.

**3.3 PIPE INSTALLATION**

- .1 Install pipes to manufacturer's standard instructions and specifications.

**3.4 VALVE AND FITTING INSTALLATION**

- .1 Install valves and fittings to manufacturer's recommendations at locations indicated on the approved drawings.
- .2 Support valves located in valve boxes or valve chambers by means of preserved wood blocks located between valve and solid ground.
- .3 All subsurface bolted connections in contact with the soil shall be stainless steel and wrapped in denso tape and shall have adequate cathodic protection as per manufacturer specifications.

**3.5 THRUST BLOCKS**

- .1 Place concrete thrust blocks to manufacturer's specifications.

**3.6 HYDROSTATIC AND LEAKAGE TESTING**

- .1 The Contractor shall provide labor, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.
- .2 The Contractor shall notify the Departmental Representative at least 24 hours in advance of all proposed tests. Perform pressure tests in presence of the Departmental Representative.
- .3 Where any section of system is provided with concrete thrust blocks, do not conduct tests until at least one (1) days after placing concrete.
- .4 Test pipeline in sections not exceeding 365 m in length, unless otherwise authorized by the Departmental Representative.

- .5 Test pipeline including service connections after all backfilling is complete, Contractor shall provide potable water for testing.
- .6 Expel air from main by slowly filling main with potable water. Close stops after satisfactory completion of test. Air pressure testing of installed PVC pressure pipe is expressly prohibited for safety reasons.
- .7 Apply hydrostatic test pressure of 1035 kPa (150 PSI) for a period of two (2) hours.
- .8 Relieve hydrostatic pressure on each section of pipeline segment at the end of the test period. If leakage is detected following the 2-hour hydrostatic pressure testing of the fused HDPE line the defect shall be located and repaired and testing repeated.

### **3.7 FLUSHING AND DISINFECTING**

- .1 Flushing and disinfecting operations shall be witnessed by the Departmental Representative. The Contractor shall notify the departmental representative at least 48 hours before the proposed date when disinfection will commence.
- .2 The Contractor shall provide connections and pumps as required to flush and disinfect all water mains to AWWA C651-86.
- .3 Flushing may proceed upon acceptance of disinfection by the Departmental Representative.
- .4 Dechlorination, is to be performed by adding neutralizing chemicals (AWWA C651-86, Appendix B) to the chlorinated water as it is flushed from the system and before it enters the receiving environment.
- .5 After final flushing, the Departmental Representative will allow 12 hours to pass before collecting water samples for bacteriological testing. The water main is to be flushed for not more than five (5) minutes before taking the sample. One sample is to be taken from each spigot location.
- .6 Bacteriological samples are to be collected by the Engineer in approved sample bottles obtained for the Provincial Laboratory of Public Health or the local Health Unit. The sample bottles shall be sterilized and contain a dechlorination reagent. Never rinse sample bottle before testing. The locations where each sample is taken must be clearly identified on the drawings provided with each sample bottle. Indicate the sample is from the newly constructed water main.
- .7 No new water main will be put into service until all excess pipe lubricant has been flushed from the main and the results of the bacteriological tests have been provided and approved by the Departmental Representative. Once satisfactory water quality and bacteriological test results have been confirmed, the water main can be used for potable water distribution.
- .8 If the initial disinfection fails to produce satisfactory bacteriological samples, the mains shall be reflushed and re-sampled. If check samples show the presence of coliform organisms, then the water main shall be rechlorinated and flushed until satisfactory results are obtained.

**END OF SECTION**

**Part 1            General**

**1.1                DESCRIPTION**

- .1            This section specifies requirements for supplying and installing components of the potable water spigot assembly.

**1.2                RELATED SECTIONS**

- .1            Section 31 23 33.01 Excavating, Trenching and Backfilling

**1.3                MEASUREMENT PROCEDURES**

- .1            **“Water Spigot Assembly as per drawing detail”**, to be paid for each spigot assembly supplied and installed to components depicted on the drawings as shown in section L7.4 “water spigot section”. Price to include all bends, transition fittings, reducers, appurtenances, wood post and concrete pad.
- .2            **“Existing well (non-potable) spigot assembly”**, to be paid by lump sum for the spigot assembly supplied and installed of components depicted on the drawings as shown in section L7.4 “water spigot section”. Price to include all bends, transition fittings, reducers, appurtenances, wood post and concrete pad. Contractor to confirm the type and size of pipe coming from the well before installation to confirm if an additional adaptor or coupling will be required to connect the source pipe to the proposed stainless steel pipe.
- .3            **“Water Assembly for water station” as per detail**, to be paid for each water station assembly supplied and installed of components depicted on the drawings as shown in section L7.2 “water station elevation” for the water supply piping below the concrete pad to the HDPE service pipe connection. Price to include all bends, transition fittings, reducers and other appurtenances as shown on the detail.
- .4            Water station and water spigot “catch basin” and “dry well” items to be paid for separately under their respected sections.
- .5            Trench excavation, compaction and backfill to be installed as per Section 31 23 33.01. No additional payment will be made for trenching, backfilling and compaction.

**Part 2            Products**

**2.1                PIPE**

- .1            20 mm (3/4 inch) stainless steel pipe for potable water use.

**2.2                PIPE JOINTS**

- .1            High Density Polyethylene Pipe joints, bends, tees will be fused as per manufacturers specifications by a certified personnel.
- .2            Stainless steel potable water pipe joints to be connected to manufactures specifications

### **2.3 FITTINGS**

- .1 A male threaded HDPE transition fitting “series 710HD Carbon steel form poly-cam” to be used for the 25mm (1”) HDPE DR 11 water service to a threaded pipe.
- .2 A reducer from the 25mm “series 710HD Carbon steel form poly-cam” threaded end to 20mm stainless steel pipe and a 90-degree bend for the 20mm stainless steel pipe.
- .3 An American Valve 3/4-in Male Brass Hose Bibb (Rona Model # M71 ¾) and required connections to the stainless steel pipe.

### **2.4 SPIGOT BASE**

- .1 101mm pressure treated SPF post
- .2 100mm thick fiber reinforced sulfate resistant 30 MPA concrete (or approved equivalent rebar reinforcement), see Section 32 13 14 for concrete specifications
- .3 Compacted gravel base to be 20mm Granular crush, see Section 31 11 42 for granular crush specifications.

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Clean pipes, fittings, valves, and appurtenances of accumulated debris and water before installation. Carefully inspect materials for defects. Mark and remove defective materials from site.

### **3.2 TRENCHING, BEDDING AND BACKFILL**

- .1 Trenching, Bedding and Backfill shall be in accordance with Section 31 22 10.
- .2 Trench alignment and depth shall be in accordance with the drawings or as approved by the Departmental Representative.
- .3 Do not backfill trenches until installed work has been inspected and approved by the Departmental Representative.

### **3.3 PIPE INSTALLATION**

- .1 Install pipes to manufacturer’s standard instructions and specifications.

**END OF SECTION**

**Part 1            General**

**1.1                DESCRIPTION**

- .1        This section specifies requirements for supplying and installing a fiberglass wastewater tank.

**1.2                RELATED SECTIONS**

- .1        Section 31 23 33.01 Excavating, Trenching and Backfilling

**1.3                MEASUREMENT PROCEDURES**

- .1        **“RV Sewage dumping station tank”**, to be paid for as a lump sum for the fibreglass wastewater holding tank supplied and installed as per the RV dump station detail on C1.4 of the design drawing set.
- .2        RV dump station lump sum to include the 100mm SDR35 sanitary piping and a 4-inch Metal Dump Station Lid with Foot Pedal, Lockable as found on <http://www.rvparksupplies.com/p/METALDUMPSTATIONLID/> (or approved equivalent).
- .3        No additional payment will be made for trenching backfill and compaction.

**1.4                DESIGN REQUIREMENTS**

- .1        Contractor shall meet the design requirements as shown in the drawings on page C1.4 for a 40,000-liter fibreglass wastewater holding tank supplied by ZCL Composites Inc. (ZCL). Contractor to provide a shop drawing from the manufacturer (ZCL) for approval by the departmental representative to verify the tank specifications on the drawings have been met by the manufacturer prior to ordering and installation.

**1.5                SUBMITTALS**

- .1        Shop drawings to indicate:
  - .1        Chamber details, components and dimensions
  - .2        Storage facilities and product handling and erection.
  - .3        Openings, sleeves, inserts and related appurtenances.
- .2        Each drawing submission shall bear the stamp and signature of a qualified professional engineer registered or licensed in Canada.

**1.6                WASTE MANAGEMENT AND DISPOSAL**

- .1        Remove from site and dispose of packaging materials at appropriate recycling facilities.

**Part 2            Products**

**2.1                TANK MATERIALS**

- .1            Supply and install all wastewater tank materials to manufacturers (ZCL) specifications and approved construction drawings.

**Part 3            Execution**

**3.1                INSTALLATION**

- .1            The Contractor shall place bedding and surrounding material in unfrozen condition.
- .2            The Contractor shall perform excavation and backfilling in accordance with Section 31 23 33.01 Excavating, Trenching and Backfilling.
- .3            The Contractor shall install tank, bedding material and all connection and appurtenances to manufacturer's specifications.

**END OF SECTION**

**Part 1            General**

**1.1                DESCRIPTION**

- .1            This section specifies requirements for supplying and installing pipe culverts.

**1.2                RELATED SECTIONS**

- .1            Section 31 22 16.13 – Roadway Subgrade Reshaping

**1.3                MEASUREMENT PROCEDURES**

- .1            **“Supply and Install 300mm CSP Culverts complete with rip rap”**, to be payed per linear meter of pipe supplied and installed including excavation and backfill around the culvert.
  - .1            No separate payment will be made for couplings and fittings required for the culvert installation.
  - .2            No separate payment will be made for rip rap protection at both culvert ends of the installed culverts as per the culvert detail as shown in the approved drawings.

**1.4                REFERENCES**

- .1            American Society for Testing and Materials International, (ASTM)
  - .1            ASTM C14M-[99], Standard Specification for Concrete Sewer, Storm Drain and Culvert Pipe (Metric).
  - .2            ASTM C76M-[02], Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric).
- .2            Canadian Standards Association (CSA International)
  - .1            CSA- G401-[01], Corrugated Steel Pipe Products.

**1.5                STORAGE AND HANDLING**

- .1            Handle and store pipe products in a manner to avoid damage, alteration, deterioration and soiling.
- .2            Store pipes on a clean and flat surface.
- .3            Where the material supplied is damaged, the Contractor shall immediately separate nested sections of the plate or pipe to facilitate more detailed inspection. Culvert material designated by the Departmental Representative as unacceptable, due to damage or failure to meet specified requirements, shall be immediately repaired or replaced by the Contractor.

**1.6                WASTE MANAGEMENT AND DISPOSAL**

- .1            Remove from site and dispose of packaging materials at appropriate recycling facilities.

**Part 2 Products**

**2.1 CORRUGATED STEEL PIPE (CSP)**

- .1 300mm Corrugated steel pipe: to CSA-G401 standards (or approved equivalent).
- .2 Minimum corrugations of 68mm x 13mm and 1.6mm wall thickness.
- .3 CSP pipe couplings as needed installed to manufacturers specifications.

**Part 3 Execution**

**3.1 TRENCHING**

- .1 The Contractor shall obtain the approval of the Departmental Representative on the trench line and depth prior to place pipe.

**3.2 BEDDING**

- .1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.
- .2 Compact the native material on the bottom of culvert excavation and compact to minimum 98% SPMDD.
- .3 Shape bedding to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Engineer free from sags or high points.
- .4 Place bedding material in unfrozen condition.

**3.3 LAYING CORRUGATED STEEL PIPE CULVERTS**

- .1 Begin pipe placing at downstream end.
- .2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.
- .3 Lay pipe with outside circumferential laps facing upstream and longitudinal laps or seams at side or quarter points.
- .4 Do not allow water to flow through pipes during construction except as permitted by the Departmental Representative.

**3.4 JOINTS: CORRUGATED STEEL CULVERTS**

- .1 Corrugated steel pipe:
  - .1 Match corrugations or indentations of coupler with pipe sections before tightening.
  - .2 Tap couplers firmly as they are being tightened, to take up slack and ensure snug fit.
  - .3 Insert and tighten bolts.

- .4 Repair spots where damage has occurred to spelter coating by applying two coats of zinc rich paint.

### **3.5 BACKFILLING**

- .1 Backfill around and over culverts as directed by the Departmental Representative.
- .2 Place backfill material, approved by Engineer in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
- .3 Compact each layer to 98% SPMDD taking special care to obtain required density under haunches.
- .4 Protect installed culvert with minimum 500 mm cover of compacted fill before heavy equipment is permitted to cross during construction until proper road base is installed. Final cover over the culvert to be a minimum of 300mm.
- .5 Place backfill in unfrozen condition.

### **3.6 RIP RAP**

- .1 Class one rip rap to be placed at both culvert ends and extends for 1m in the direction of water flow.
- .2 Rip Rap is to be keyed into the ground by 100mm as shown on the civil detail drawings.

**END OF SECTION**