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**Drawings :**

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2511-00681-00	C00	REV 1 12/06/2019	COVER PAGE
2511-00681-00	C001	REV 1 12/06/2019	LOCATION PLAN, LEGEND & DRAWING INDEX
2511-00681-00	C002	REV 1 12/06/2019	KEY PLAN (PLAN & PROFILE AND PAVEMENT MARKINGS & SIGNAGE)
2511-00681-00	C101	REV 1 12/06/2019	PASSING LANE PLANE & PROFILE STA 2+428.91 TO STA 2+850
2511-00681-00	C102	REV 1 12/06/2019	PASSING LANE PLANE & PROFILE STA 2+850 TO STA 3+350
2511-00681-00	C103	REV 1 12/06/2019	PASSING LANE PLANE & PROFILE STA 3+350 TO 4+150
2511-00681-00	C104	REV 1 12/06/2019	PASSING LANE PLANE & PROFILE STA 4+150 TO 4+563.58
2511-00681-00	C301	REV 1 12/06/2019	PASSING LANE KM2.5 TO 4.5 TYPICAL SECTIONS
2511-00681-00	C302	REV 1 12/06/2019	PASSING LANE CULVERT DETAILS
2511-00681-00	C401	REV 1 12/06/2019	PASSING LANE PAVEMENT MARKINGS & SIGNAGE STA 2+428.91 TO STA 3+500
2511-00681-00	C402	REV 1 12/06/2019	PASSING LANE PAVEMENT MARKINGS & SIGNAGE STA 3+500 TO STA 4+563.58

## **Reference Documents:**

1. Parks Canada National Best Management Practices – Roadway, Highway, Parkway and Related Infrastructure, May 2015
2. Pratiques exemplaires nationales de gestion de Parcs Canada - Routes, autoroutes, promenades et infrastructure connexe – Mai 2015
3. Whirling Disease in Banff National Park (BNP), Alberta – Direction for Permitted Users conducting water-related activities in BNP – October 2016.
4. Tournis des truites – Unité de gestion du secteur de Lake Louise et des parcs nationaux Yoho et Kootenay – avril 2017
5. Standard CMS Translations July 2018
6. Construction Signage Translation July 2018

## **01 11 00 SUMMARY OF WORK**

### **Part 1 General**

#### **1.1 PRECEDENCE**

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

#### **1.2 DEFINITIONS**

- .1 British Columbia Ministry of Transportation and Infrastructure is referred to as "MoTI".
  - .1 BC MoTI specifications specified for the work can be found at the following website address:  
<http://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/standard-specifications-for-highway-construction>
- .2 Alberta Transportation is referred to as "AT".
  - .1 AT specifications specified for the work can be found at the following AT website address:  
[http://www.transportation.alberta.ca/images/Standard\\_Specifications\\_for\\_Highway\\_Construction\\_2013.pdf](http://www.transportation.alberta.ca/images/Standard_Specifications_for_Highway_Construction_2013.pdf)
- .3 Changes in Definition, - The following changes in definitions have been made to the "BC MoTI Specifications":
  - .1 Ministry Representative – The word "Ministry Representative" shall mean Parks Canada Departmental Representative or their duly appointed representative.
  - .2 Ministry – The word "Ministry" shall mean Parks Canada Agency.
- .4 Changes in Definition, - The following changes in definitions have been made to the "AT Specifications":
  - .1 Consultant – The word "Consultant" shall mean Departmental Representative or their duly appointed representative.
  - .2 Department – The word "Department" shall mean Parks Canada Agency.
- .5 Jasper National Park of Canada is referred to as "JNP".
- .6 Hwy 16 means Highway 16 (Yellowhead Highway)
- .7 Parks Canada Agency is referred to as "PCA".
- .8 Canadian Pacific Railway is referred to as "CP Rail".
- .9 Environmental Surveillance Officer is referred to as "ESO".
- .10 Watercourse is as defined in the National Parks Act.
- .11 Site means the areas on or within the limits of Construction as referenced on the Drawings and/or described in the Contract Documents.
- .12 Work means the provision of all labour, services, material, and equipment as necessary for the Contractor to complete and perform its obligations in accordance with the Contract.

### **1.3 PROJECT LOCATION**

- .1 The project is located in Jasper National Park, Alberta. Construction work is on Highway 16 between Km 2.43 and Km 4.56. The following are key locations relative to the project:
  - .1 Hwy 16 km 0.8 – JNP East Gate
  - .2 Hwy 16 km 73.6 – JNP West Gate

### **1.4 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 The project work consists of approximately 2 km of passing lane construction along Highway 16 between Km 2.43 and Km 28.63
- .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, as directed by the Departmental Representative:
  - .3 Clearing and Grubbing of areas designated in the Contract documents in accordance with Section 31 11 00 – Clearing and Grubbing.
  - .4 Stripping of organic material designated in the Contract documents and in accordance with Section 31 24 13 – Roadway and Drainage Excavation.
  - .5 Installation and maintenance of temporary barriers and supply and installation of temporary traffic control and other temporary construction facilities required for the Work.
  - .6 Removal of existing asphalt by milling and stockpiling material in accordance with Section 02 41 13 – Asphalt Pavement Removal.
  - .7 Excavating all types of material from the right-of-way cuts, hauling and placing this material in embankments or in stockpiles designated in the Contract Documents and in accordance with Section 31 24 13 – Roadway and Drainage Excavation.
  - .8 Supply and install Corrugated Steel Pipe (CSP) culverts at locations designated in the Contract documents and in accordance with Section 33 42 13 – Pipe Culverts.
  - .9 Supply, load, haul and place sub-base course materials in accordance with Section 32 11 24 - AT Designation 2 Class 40 Base Course Aggregate. Gravel fill to be supplied by the Contractor
  - .10 Supply, load, haul and place base course materials in accordance with Section 32 11 24 - AT Designation 2 Class 20 Base Course Aggregate. To be supplied by the Contractor.
  - .11 Perform mix design for AT Mix Type H1 (16mm) Asphalt Concrete Pavement using PG 58-28 Asphalt Binder. AT Designation 1 Class 16 Asphalt Aggregate is to be supplied by the Contractor.
  - .12 Use of processed Reclaimed Asphalt Pavement (RAP) material in hot mix asphalt construction is permitted to maximum 10% in accordance with AT Standard Specifications for Highway Construction Section 3.50 (latest edition) and as accepted by the Departmental Representative.
  - .13 Purchase asphalt binder PG 58-28 mix with aggregate, haul and place AT Mix Type H1 (16mm) Asphalt Concrete Pavement as directed by the Departmental Representative.

- .14 Remove and dispose of existing CSP culverts in accordance with Section 33 42 13 – Pipe Culverts, as per the Contract Documents and as directed by the Departmental Representative.
- .15 Supply and installation of new CSP culverts as per the Contract Documents and as directed by the Departmental Representative in accordance with 33 42 13.
- .16 Installation of Riprap in accordance with Section 31 37 00 – Riprap.
- .17 Placement of screened topsoil on finished slopes in accordance with Section 32 91 19 – Topsoil Placement and Grading.
- .18 Supply and installation of hydroseeding on finished slopes in accordance with Section 32 92 22 – Hydraulic Seeding.
- .19 Supply and install permanent Guide Posts as per the Contract Documents and as directed by the Departmental Representative in accordance with Section 32 17 31 – Guide Posts.
- .20 Supply and install temporary roadway paint markings during construction as required in accordance with Section 01 35 31 – Special Procedures for Traffic Control.
- .21 Supply and install Permanent line markings as per the Contract Documents and as directed by the Departmental Representative in accordance with Section 32 17 23 – Pavement Marking.
- .22 Supply and install regulatory signs in accordance with Section 10 14 53 – Traffic Signage.
- .23 Traffic signage, control and other traffic accommodations in accordance with Section 01 35 31 – Special Procedures for Traffic Control.
- .24 Miscellaneous Additional Work as directed by the Departmental Representative.
- .4 The Contractor will not be permitted to set up a crushing plant within the National Parks
- .5 The Contractor will not be permitted to set up a Mobile Asphalt Plant or use a Stationary Asphalt Plant for this Project within the National Parks.
  - .1 The asphalt plant to be used on this project, regardless of location, shall be a minimum of 200 tonnes per hour production, equipped with a dry bag system for pollution control, in addition to, or in replacement of standard cyclone dust collectors, to effectively eliminate emissions of dust and smoke pollutants into the atmosphere.
- .6 The Contractor is responsible for sourcing water required for the Works and may be required to obtain it from outside of the National Parks. Accessing local water sources in nearby pits or from other Parks facilities can be coordinated through the Departmental Representative and the ESO but will require the Contractor to obtain a Restricted Activity Permit and to adhere to all conditions contained therein.
- .7 In preparation for and during construction of this project, an “Environmental Protection Plan” (EPP) is to be prepared by the Contractor to meet the requirements of Section 01 35 43 – Environmental Procedures to ensure the desired minimal adverse effects are achieved. The Contractor’s EPP must be approved by Parks Canada Agency prior to the commencement of construction. The Departmental Representative and Parks Canada’s Environmental Surveillance Officer (ESO) will refer to the approved EPP in determining compliance with the Plan and Contract Documents. The EPP will form part of the Contract.

- .8 Where material and construction specifications for work covered under the Contract, including any Change Orders are not available, **AT - Standard Specifications for Highway Construction (latest edition)** shall apply unless directed otherwise by the Departmental Representative.

## 1.5 CONTRACT METHOD

- .1 Construct Work under combined price Contract.

## 1.6 WORK BY OTHERS

- .1 The Contractor is advised that the following Work and anticipated completion in the vicinity has been or will be contracted by Parks Canada:
- .1 Other projects and maintenance work may occur along Highway 16 in 2020
- .2 Where it is necessary that work is to proceed in areas of this project common to both the Contractor and forces of others, the Contractor shall cooperate with the other Contractors and the PCA Departmental Representative in reviewing their construction schedules and sharing their work space, and shall coordinate their operations with the other Contractors, including traffic management and construction staging.
- .3 The Contractors shall coordinate all work on this project with other Contractors including Site Safety and Traffic Control.
- .4 The borrow, staging areas and pits mentioned in the Contract Documents are operational and are used by many contractors and Parks Canada. The Contractor shall coordinate and cooperate with the other users of the applicable areas.

## 1.7 WORK SEQUENCE

- .1 Schedule work progress to allow Owner / Departmental Representative unrestricted access to inspect all phases of the Work.
- .2 Maintain fire and emergency access on the roadways at all times.
- .3 Co-ordinate Work with other Contractors / Departmental Representatives doing maintenance, survey / testing work.
- .4 The Contractor shall prepare a meaningful bar chart or network diagram showing the proposed schedules of major work, which shall be submitted to the Departmental Representative in accordance with Section 01 32 16 - Construction Progress Schedules.
- .5 The Contractor shall:
- .2 **Complete all clearing by before April 15, 2020.**
- .3 **Obtain the Interim Certificate (Substantial Performance) by July 25, 2020.**
- .4 **Complete all of the Work by August 1, 2020 (Contract Completion Date).**

## 1.8 CONTRACTOR USE OF PREMISES

- .1 Contractor has unrestricted use of site subject to Section 01 14 00 –Work Restrictions and Section 01 29 01 – Site Occupancy, until Contract Completion date. The Contractor's use of the site is not exclusive of other contractors or work zones within the limits of this Contract.
- .2 Contractor shall limit use of premises for Work, for storage, and for access, to allow:
- .1 Owner occupancy.
- .2 Work by other Contractors.



- .3 Coordinate use of premises under direction of the Departmental Representative.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 The Contractor and any subcontractors shall obtain a business license and vehicle work passes in accordance with Section 01 35 43 - Environmental Procedures.

#### **1.9 OWNER OCCUPANCY**

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.
- .3 Contractor must allow access to the Work Site for other Contractors and PCA. It is up to the Contractor to plan their work accordingly.

#### **1.10 OWNER FURNISHED ITEMS**

- .1 None.

#### **1.11 CONSTRUCTION SIGNAGE**

- .1 To be in accordance with Section 01 35 31 - Special Procedures for Traffic Control.
- .2 Signage shall be coordinated with other Contractors.
- .3 No signs or advertisements, other than warning signs, are permitted on site.

#### **1.12 SETTING OUT OF WORK**

- .1 Departmental Representative will establish control points and provide:
  - .1 Detailed cross-section templates showing design centreline and shoulder grades.
  - .2 Complete set of construction Drawings.
  - .3 Alignment notes showing curve data and control point coordinates.
  - .4 Provide a list of control monuments including coordinates and elevations on request.
  - .5 Measurements for Payment (Quantity Surveys) and volumes by the surface to surface prismoidal method for roadway and drainage excavation and neat line for all surfaces above the excavated surface at a maximum of 20m intervals. Coordinates unless otherwise stated are UTM Grid and no adjustments will be made to scale the coordinates to ground when calculated volumes by cross-section or setting out of work.
- .2 Contractor shall:
  - .1 Not permanently mark any infrastructure or feature during their setting out of the work. They shall fully remove any set out marks, markers, or other identifiers that they installed, prior to demobilizing from the Work Sites.
  - .2 Set additional control points as necessary.
  - .3 Set all work stakes necessary to complete work.
  - .4 Allow sufficient time for Departmental Representative to take measurements for payment.



- .5 Not damage geodetic benchmarks or control monuments unless authorized by Departmental Representative.
- .3 No separate payment for setting out work, unless changes are made and approved by the Departmental Representative and additional survey costs are incurred. Payment for additional survey required due to changes by Departmental Representative to be paid for as part under **“Lump Sum Price Item 3 – Prime Cost Sum”**.

**Part 2 Products**

- .1 To be in accordance with AT - Standard Specifications for Highway Construction (latest edition).

**Part 3 Execution**

- .1 To be in accordance with AT - Standard Specifications for Highway Construction (latest edition).

**END OF SECTION**

## **01 14 00 WORK RESTRICTIONS**

### **Part 1 General**

#### **1.1 MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.2 ACCESS AND EGRESS**

- .1 Provide for pedestrian, cyclist, and vehicular traffic for the duration of the construction.
- .2 Construction operations shall be conducted to cause minimal inconvenience to the public and to owners of adjoining property. Existing access to property shall be maintained as far as possible and if new access must be provided, every effort shall be taken to provide the new access before the existing access is removed. Contractor will be responsible for repairing any damage incurred, at the Contractor's cost.
- .3 The Contractor is responsible for the development and supply of construction access to the Work as approved by the Departmental Representative.

#### **1.3 USE OF THE SITE AND FACILITIES**

- .1 The Work Sites specified in the Contract shall only be used for the purposes of the Work.
- .2 The Work Site (limits shown on the Drawings) will be specified by Parks Canada and shall only be used for the purposes of the Work. The Work Site will be made available by Parks Canada to the Contractor for its non-exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.
- .3 The Contractor will not be permitted to set up a camp in the National Parks. PCA regulations prohibit anyone working within the Park from using public campground facilities.
- .4 The Contractor shall not store material or park equipment along the Highway Right of Way within the clear zone.
- .5 Contractor shall maintain adequate drainage at the Work Site.
- .6 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of source. Snow shall be removed by the Contractor as necessary and at their cost for the performance and inspection of the Work.
- .7 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations and Section 01 35 43 - Environmental Procedures. The Contractor shall post notices and take such precautions as required by local health authorities and keep area and premises in sanitary condition.
- .8 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at their expense.
- .9 Pets shall not be brought to or maintained at the construction site.

#### **1.4 WORKING TIMES**

- .1 Work in JNP is permitted during daylight hours from 06:00 to 22:00, 7 days per week unless stipulated otherwise in the Contract Documents.

- .2 The Contractor will not be permitted to work during the period of any Alberta or British Columbia statutory holiday long weekend, including one day prior to and one day following. The Contractor will not be permitted to work during the following Civic Holidays or long weekends unless prior written approval is granted by the Departmental Representative:
  - .6 Statutory and Civic Holidays (2020)
    - .1 Good Friday weekend: From 22:00 Thursday, April 10, 2020 to 06:00 Tuesday, April 23, 2020.
    - .1 Victoria Day Weekend: From 22:00 Thursday May 18, 2020 to 06:00 Tuesday, May 21, 2020.
    - .2 Canada Day weekend: From 22:00 Thursday July 2, 2020 to 06:00 Tuesday, July 7, 2019.
    - .3 Heritage Day weekend: From 22:00 Thursday July 30, 2020 to 06:00 Tuesday August 4, 2020.
    - .4 Labour Day long weekend: From 22:00. Thursday, September 3, 2020 to 06:00 Tuesday, September 8, 2020.
    - .5 Thanksgiving Day weekend: From 22:00 Thursday, October 8, 2020 to 06:00 Tuesday, October 13, 2020.
    - .6 Remembrance Day Weekend: From 22:00 Thursday, November 13, 2020 to 06:00 Tuesday, November 18, 2020.
- .3 Variance of the Working Times and any others may be provided on the strict condition of satisfactory performance in all requirements as determined at the Departmental Representative's discretion and may be revoked at any time for any reason. It is provided on the presumption that no additional costs or any delay will be attributed to Parks Canada in relation to conducting Works in accordance with the Variance and if that is not the case, the Contractor shall not commence work under the Variance. No claims for additional costs, delays, schedule impacts, loss of productivity or other extra Works resulting from a Variance will be entertained.

## **1.5 WORK CONDUCTED OVER OR ADJACENT TO WATERWAYS**

- .1 All components of the Work shall be conducted in accordance with Section 01 35 43 – Environmental Procedures and the Environmental Protection Plan prepared for the project.
- .2 All components of the Work shall be conducted without equipment entering into wetlands, water bodies, or streams.
- .3 All waste materials from the Work shall be contained and collected in a manner to prevent any contact with the river valleys and waterways. All collected waste materials shall be disposed of in accordance with Section 01 35 43 – Environmental Procedures and the Environmental Protection Plan prepared for the Project.

## **1.6 UTILITIES**

- .1 The Contractor shall become familiar with all utilities and services adjacent to the Work and shall be responsible for cost of repair of any damage resulting from their operations.
- .2 The Contractor shall establish and maintain direct and continuous contact with the owners or operators of any Utilities which may interfere with the Work. The Contractor shall co-operate with them at all times and in all places of Work. The Contractor shall

- keep the Departmental Representative informed of all communications with the Utility companies and authorities.
- .3 The Drawings include indicative utility details from within the area for reference however the Contractor remains fully responsible for determining the full and accurate extent of utilities within the area of their Works.
  - .4 The Contractor shall notify the Departmental Representative and the Utility companies at least seven (7) days in advance of any activities which may interfere with the operation of such Utilities.
  - .5 Whenever working in the vicinity of Utilities, the Contractor shall locate such Utilities and expose those that may be affected by the Work, using hand labour as required.
  - .6 The Contractor shall assess the possible impact of its operations on all Utilities that may be affected by its operations, and shall, in consultation with Utility owner(s), protect, divert, temporarily support or relocate, or otherwise appropriately treat such Utilities to ensure that they are preserved.
  - .7 The Contractor shall immediately report any damage to Utilities to the Departmental Representative and to the Utility company or authority affected, and shall promptly undertake such remedial measures as are necessary at no additional cost to the Owner.

#### **1.7 SURVEY OF EXISTING CONDITIONS**

- .1 Submission of tender is deemed to be confirmation that the Contractor has inspected the Site and is conversant with all conditions affecting execution and completion of work.
- .2 The Contractor shall regularly monitor the condition of the Work Site and of property on and adjoining the Work Site throughout the construction period, and shall immediately notify the Owner if any deterioration in condition is detected. Such monitoring shall cover all pertinent features and property including, but not limited to, buildings, structures, roads, walls, fences, slopes, sewers, culverts and landscaped areas.
- .3 The Departmental Representative may, but shall not be obligated to, survey and record the condition of the Work Site and of property on or adjoining the Work Site prior to the commencement of construction by the Contractor. If requested and available, the Departmental Representative will provide a copy of the survey records to the Contractor for reference.
- .4 Whenever supplied with survey records, the Contractor shall satisfy itself as to the accuracy and completeness of the survey records provided by the Departmental Representative for any area before commencing construction in that area.
- .5 Commencement of construction in any area shall be interpreted to signify that the Contractor has accepted such survey records as being a true record of the existing conditions prior to construction.
- .6 The provision of the records of a survey of existing conditions by the Departmental Representative shall in no way limit or restrict the Contractor's responsibility to exercise proper care to prevent damage to all property within or adjacent to the Work Site, whether all such property is covered by the survey or not.

#### **1.8 ARCHAEOLOGICAL RESOURCES**

- .1 As identified in the Basic Impact Analysis known archaeological sites and others that have high archaeological potential are located within the construction limits. The Archaeological Overview Assessment (AOA), included in the BIA, provides a list of areas of archaeological concern.

- .2 The Contractor shall undertake the Works in accordance with the Archaeological Impact Assessment Letter of Clearance and AOA as described in Section 01 35 43 - Environmental Procedures.

## **1.9 INSTREAM WORK**

- .1 Contractor shall adhere to recommendations for measures and standards to mitigate serious harm to fish as identified in Section 01 35 43 – Environmental Procedures and the Reference Documents.
- .2 The period of least risk for instream works is as listed in the Contract Documents.
- .3 No work identified in Section 01 35 43 – Environmental Procedures, or otherwise, as requiring DFO Request for Review is to occur until such a review has been completed by the Departmental Representative.

## **1.10 PROTECTION OF PERSONS AND PROPERTY**

- .1 The Contractor shall comply with all applicable safety regulations of WorkSafe AB and the Workers Compensation Act of British Columbia and Alberta including, but not limited to, Occupational Health and Safety Regulations and General Safety Regulations. Within the Site, the Contractor has all the responsibilities of an “employer” under the *Workers Compensation Act* and the *Occupational Health and Safety Regulation* and is designated as the “Prime Contractor”.
- .2 Prime Contractor must comply with Workers Compensation Act and Occupational Health and Safety Regulation Section 20.3 Coordination of multiple employer workplaces.
- .3 Comply with all applicable safety regulations of the Workers’ Compensation Board of British Columbia and Alberta (WCB) including, but not limited to, WCB’s Industrial Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations, when working in that province.
- .4 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.
- .5 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Site.
- .6 The Contractor shall promptly take such measures as are required to repair, replace or compensate for any loss or damage caused by the Contractor to any property or, if Parks Canada so directs, shall promptly reimburse to Parks Canada the costs resulting from such loss or damage.

## **1.11 USE OF PUBLIC AREAS**

- .1 Off-road construction equipment will not be allowed on the existing highway except at designated areas where the existing highway is scheduled for re-construction in this Contract, material loading areas, or alternate sites as designated and approved by the Departmental Representative.
- .2 Steel tracked equipment with cleats will not be allowed on pavement designated for future use. If or when crossing asphalt designated for future use, rubber mats must be used under the tracks to protect the asphalt. Asphalt, granular, embankment and excavation materials may be hauled on existing highway but this shall be by standard highway trucks not exceeding legal highway load limits unless accepted in writing by the Departmental Representative.

- .3 Flag persons shall be provided when vehicles are entering or exiting Work Site access points and when vehicles are entering or exiting gravel pits in the park. Pit access gates must remain closed at all times or have a gate person monitoring the opening for wildlife.
- .4 The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle. All vehicles arriving at or leaving the Work Site and transporting materials shall be loaded in a manner that will prevent dropping of materials or debris on the roadways and, where contents may otherwise be blown off during transit, such loads shall be covered by tarpaulins or other suitable covers. Spills of materials in public areas shall be removed or cleaned immediately by the Contractor at no cost to the Owner. All activities shall be in accordance with Section 01 35 43 – Environmental Procedures and the Environmental Protection Plan prepared for the project.
- .5 Construction areas and construction crossings shall be flood-lit for night operations.

#### **1.12 USE OF PITS AND QUARRIES**

- .1 The Contractor is not approved to use any existing pits or quarries within the National Parks.

#### **1.13 USE OF PITS, QUARRIES, AND DISPOSAL SITES, OUTSIDE OF THE NATIONAL PARKS**

- .1 When the Contractor is supplying material from a pit or quarry outside of the National Parks the Contractor is responsible for all permits and approvals. Pit or quarry development and reclamation must be in accordance with local and Provincial regulatory agency requirements.
- .2 When the Contractor is disposing of; stripping, unsuitable, or surplus material in a pit or other disposal sites outside of the National Parks the Contractor is responsible for all permits and approvals. Disposal site or pit development and reclamation must be in accordance with local and Provincial regulatory agency requirements.
- .3 The Contractor shall bear and pay all costs, fees, and royalties for pits, quarries, or disposal sites, outside of the National Parks.
- .4 Material supplied from pits and quarries outside of the National Parks must be clean of all, seeds, organics, top soil, or contaminants. No additional payment will be made for cleaning or washing material supplied from pits and quarries outside of the National Parks.
- .5 Material supplied from pits and quarries outside of the National Parks must meet requirements in the Contract Documents.
- .6 Pit excavation must not take place to within a minimum distance of 2m from the edge of cleared and stripped areas.
- .7 All working pit faces and stockpiles must be trimmed to 1.5H to 1V slope. Working pit faces must be reshaped with native granular materials. All other permanent slopes must be re-sloped to no steeper than 2H to 1V.
- .8 No dumping of debris or petroleum products is permitted. The pit must be left in a clean and safe condition.



- .9 Pit work must be carried out in accordance with the local provincial government Health, Safety and Reclamation requirements, the current Standard Specifications for Highway Construction and Best Management Practices for the area the Work is occurring in.

#### **1.14 SUPERVISORY PERSONNEL**

- .1 When requesting a Preconstruction Meeting, in accordance with Section 01 31 00 - Project Management and Coordination, the Contractor shall submit to the Departmental Representative confirmation of the names of the supervisory personnel and other key staff designated for assignment on the Contract.
- .2 At a minimum, the following personnel shall be included in the list:
- .1 Contractor Manager
  - .2 Project Superintendent;
  - .3 Safety Representative;
  - .4 Quality Control Manager;
  - .5 Environmental Representative;
  - .6 Traffic Control Representative;
- .3 The above personnel shall perform the following duties:
- .1 Contractor Manager with full authority, as agent of the Contractor, to act on behalf of and legally bind the Contractor in connection with the Work and the Contract. The Contractor may, at its discretion, appoint one person as both Contractor Manager and Project Superintendent.
  - .2 The Project Superintendent shall be employed full time with full authority to supervise the Work, who shall be directly available to the Department Representative during all active periods of Work. Either they or their designated deputy shall be present on the Work Site each and every workday that Work is being performed, from the commencement of Work to Total Performance of the Work.
  - .3 The Project Superintendent shall nominate a Deputy Project Superintendent who shall have the authority of the Project Superintendent during the latter's absence.
  - .4 The Safety Representative shall possess a minimum of 2 years' construction safety supervisory experience. Their duties shall encompass all matters of safety activities from commencement of Work until the Total Performance of the Work.
  - .5 The Quality Control Representative shall be responsible for the development, implementation and execution of the Quality Management Plan and shall be the single point of contact for all quality related queries.
  - .6 The Traffic Control Representative shall be responsible for the development, implementation and execution of the Traffic Management Plan and shall be the single point of contact for all traffic control related queries.
  - .7 The Environmental Representative shall be responsible for the development, implementation and execution of the Environmental Protection Plan and shall be the single point of contact for all environmental related queries.

#### **1.15 WASTE MANAGEMENT AND DISPOSAL**

- .1 All surplus, unsuitable and waste materials shall be removed from the Work Sites to approved sites outside the National Parks. Refer to Section 01 35 43 - Environmental Procedures.



- .2 Deposit of any construction debris into any waterway is strictly forbidden.
- .3 Cost for Waste management and disposal described above shall be considered incidental to the Unit Price items and no additional payment will be made.

#### **1.16 WORK STOPPAGE**

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

#### **1.17 WINTER SHUTDOWN**

- .1 If the Work is scheduled to span over winter months, the Contractor shall prepare the Site for safe, efficient winter operations and the travelling public. Winter shutdown requirements include, but are not limited to, Erosion and Sediment Controls, relocation or installation of barriers, re-instatement of damaged pavement, line painting, traffic signage, and re-instatement of existing highway speed limits for winter shutdown.
- .2 Although no guarantee is provided as to when winter shutdown will be required, in the past it has been mid-October to June 1.
- .3 The Contractor shall arrange a meeting with the Departmental Representative in mid-September, or as weather dictates, to review winter shutdown requirements.
- .4 All winter shutdown requirements shall be made to the satisfaction of the Departmental Representative, and no additional payment will be made.

### **Part 2 Products**

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

### **Part 3 Execution**

#### **3.1 NOT USED.**

**END OF SECTION**

## **01 21 00 ALLOWANCES**

### **Part 1 General**

#### **1.1 REFERENCES**

- .1 General Conditions.

#### **1.2 PRIME COST SUM**

- .1 Included in Contract Price a total Prime Cost Sum of: **\$350,000.00**
- .2 Do not include in the Contract Price, additional contingency allowances for products, installation, overhead or profit.
- .3 Prime Cost Sum provided for in the Lump Sum Arrangement Table is not a sum due to the Contractor. Rather, payment will be made against it for miscellaneous work not included in the unit price table under the General Conditions of the Contract.
- .4 No interpretation of the items listed under Prime Cost Sum Allowances shall indicate that work will be included under the Prime Cost Sum. Items, tasks, and activities included in the Works elsewhere in the Contract, including Unit Price and Lump Sum Items, shall be paid as indicated in those sections and not under the Prime Cost Sum.
- .5 Any and all additional work must be approved in writing by the Departmental Representative prior to commencement.
- .6 All expenditures must be substantiated with verified invoices and/or accepted daily extra work reports as noted in Measurement and Payment Procedures below.
- .7 Such work may include, but not be limited to:
  - .1 Additional supply and delivery of bituminous materials including asphalt prime, anti-stripping agents, and warm mix A/C admixtures;
  - .2 Supply and implementation of full depth reclamation additives;
  - .3 Additional supply and installation of asphalt concrete pavement;
  - .4 Additional supply and installation of granular sub-base and base course materials;
  - .5 Installation of integral asphalt curb;
  - .6 Additional pavement removal;
  - .7 Crack filling, pot hole patching and other related minor asphalt repairs;
  - .8 Additional Clearing and Grubbing;
  - .9 Sale of merchantable timber to a mill or equivalent as directed by the Departmental Representative. Revenue generated from this sale will be credited back to this Contract;
  - .10 Additional stripping, excavation and disposal of waste materials as directed by the Departmental Representative;
  - .11 Danger tree assessment and removal;
  - .12 Additional relocation or removal and disposal of existing signs, guardrail, guide posts and other miscellaneous items;
  - .13 Supply and installation of permanent signs (not construction signs);
  - .14 Removal and disposal or plugging of existing culverts;

- .15 Additional supply and installation of lane markings;
- .16 Supply and installation of specialty items at Day Use Areas including, but not limited to, dry toilets, picnic tables, and garbage bins;
- .17 Additional survey resulting from changes made by the Departmental Representative;
- .18 Relocation / protection of existing utilities, including payment of utility service provider costs;
- .19 Utility Pole Relocation;
- .20 Additional remediation or removal and replacement of unsuitable or contaminated soils not described in the Contract Documents;
- .21 Supply and installation of wildlife fencing;
- .22 Additional supply and installation of seeding;
- .23 Supply and installation of additional landscaping;
- .24 Additional supply and installation of Riprap;
- .25 Additional road structure repairs;
- .26 Additional drainage improvements, ditching, culvert repairs, cleaning or other;
- .27 Sub-drainage not specified in the tender documents;
- .28 Additional supply and installation of precast concrete barrier;
- .29 Supply and installation of barrier drains;
- .30 Removal and reinstallation of existing crash attenuator;
- .31 Supply and installation of W-Beam Guardrail or Impact Absorbing End Treatment materials.
- .32 Removal and disposal of existing guardrail or precast concrete barrier;
- .33 Additional supply and installation of Guide Posts;
- .34 Additional supply and installation of raised reflective road and barrier markers
- .35 Asphalt EPS unit price adjustments;
- .36 Additional installation of milled rumble strips;
- .37 Rehabilitation work in gravel pits;
- .38 Miscellaneous rock scaling as directed by the Departmental Representative;
- .39 Supply and installation of rock bolts;
- .40 Shoulder graveling;
- .41 Traffic control equipment additional to is required by the applicable regulations and standards.
- .42 Relocation of existing structures;
- .43 Additional processing of blast rock as requested by the Departmental Representative;
- .44 Removal and disposal of Unexploded Ordnances;
- .45 Supply and maintenance of Departmental Representative's office trailer; and
- .46 Miscellaneous work as directed by the Departmental Representative.
- .8 The Contract Price, and not Prime Cost Sum, includes Contractor's overhead and profit in connection with the Work.

### 1.3 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Payment for Work under the **“Lump Sum Price Item 3 – Prime Cost Sum”** made using negotiated rates or by material, labour and equipment rates as per the following:
  - .1 Rental rates will be in accordance with current Alberta Roadbuilders & Heavy Construction Association’s rate schedule and will be all inclusive and fully operated.
  - .2 Vehicles (ie. Pickup trucks) will be paid either at daily rates as per the Alberta Roadbuilders & Heavy Construction Association’s (most recent) or by mileage using National Joint Council (NJC) rates, whichever is lower. The Contractor will not be permitted to claim both daily rental and mileage rates.
  - .3 Hourly rental of equipment will be measured in actual working time and necessary travel time within project limits. Transportation time to and from site to be reimbursed only if equipment is used exclusively for additional work.
  - .4 Equipment paid on standby will be paid on 50% of the relevant Less Operator rates to a maximum of 10 hours per day.
  - .5 When based upon actual costs for additional works under Prime Cost Sum, payment will be based upon supplied invoices and other work records.
  - .6 The Prime Contractor may apply a 10% mark-up to subcontractor or supplier invoices only, as accepted by the Departmental Representative. No mark-up will be allowed on relevant equipment and labour rates.
  - .7 A claim for additional payment will be considered submitted when all required documentation has been received by the Departmental Representative.
  - .8 The Departmental Representative’s, or their delegate’s, signature on extra work reports is only a record of the equipment, materials and labour hours utilized on the task, not an agreement to entitlement or quantification of that Work. Review and acceptance may be based on Contractor submitted finalized extra work reports, which are to include appropriate rates, quantities and applicable invoices. Labour and equipment rates are to be reviewed by the Departmental Representative against the appropriate accepted rates when submitted for payment.
  - .9 The Contractor shall submit extra work reports to the Departmental Representative within 24 hours of the day of extra work.
    - .1 Extra work reports not submitted within the specified timelines may be denied payment at the Departmental Representative’s sole discretion.
  - .10 The Departmental Representative’s, or their delegate’s, signature on any of the Contractor’s Daily Extra Work Reports shall not be an agreement to waive any portion of the Contract regardless of any wording to the contrary.
  - .11 Unless otherwise provided for in the Contract, payment on a time and materials basis represents complete payment (exclusive of GST) and reimbursement for all impacts, related costs and expenses, including, without limitation: time; labour; materials; equipment; mobilization; subcontracting; overhead; profit; general supervision; occupational tax and any other Federal or Provincial revenue legislation exclusive of GST; premiums for public liability and property damage insurance policies; bonding; for the use of all tools and equipment for which no specific rental payment provision exists; and for all costs incurred by the Contractor in supplying materials.

- .12 Reimbursement for Living Out Allowance (LOA), as agreed upon by the Departmental Representative, shall be pro-rated based on the portion of the standard 10-hour work day spent on extra work items up to a maximum of 10 hours. LOA reimbursement will only be considered for extra works completed under Force Account rates and payment for LOA will not exceed the agreed upon daily rate.

**Part 2 Products**

- .1 Products shall be in accordance with AT - Standard Specifications for Highway Construction (latest edition) or as directed by the Departmental Representative.

**Part 3 Execution**

- .1 Work shall be in accordance with AT - Standard Specifications for Highway Construction (latest edition) or as directed by the Departmental Representative.

**END OF SECTION**

## **01 25 20 MOBILIZATION AND DEMOBILIZATION**

### **Part 1 General**

#### **1.1 DESCRIPTION**

- .1 Mobilization and Demobilization consists of preparatory work and operations including but not limited to, those necessary for the movement of personnel, equipment, camp, buildings, shops, offices, supplies and incidentals to and from the project sites.
- .2 Any protective measures or movement of Contractor trailers necessitated by animal interactions and required by Parks Canada will be paid by the Departmental Representative, and are not to be anticipated in the Lump Sum Contract Price for Mobilization and Demobilization.

#### **1.2 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Mobilization and Demobilization:
  - .1 Payment will be made under **“Lump Sum Price Item 1 – Mobilization / Demobilization”**.
  - .2 50% of Lump Sum Contract Price for Mobilization and Demobilization to be paid when mobilization to site is complete.
  - .3 The remainder of the Lump Sum Price for Mobilization and Demobilization to be paid when work is complete and all materials, equipment, camp, buildings, shops, offices, and other facilities have been removed from site and site cleaned and left in condition to the satisfaction of the Departmental Representative and all other Agencies having Jurisdiction.
  - .4 Payment of only **5%** of the total price tendered will be scheduled as outlined above. If the amount bid for mobilization and demobilization is greater than **5%** of the total price tendered, payment of the remainder of the amount will be authorized when the Contract has been completed.

### **Part 2 Products**

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

### **Part 3 Execution**

#### **3.1 NOT USED.**

**END OF SECTION**

## **01 29 01 SITE OCCUPANCY**

### **Part 1 General**

#### **1.1 DEFINITION OF OCCUPANCY**

- .1 The Contractor shall be permitted to lease and occupy sites where they will be working in the National Parks, free of charge from the date of award of the Contract up to and including the specified completion date. The sites to be leased by the Contractor include all the roads and areas specified in the Contract Documents and as directed by the Departmental Representative.
- .2 The Contractor's occupancy of the sites identified in Contract will be deemed to have ended, when the following conditions are met to the satisfaction of Parks Canada:
  - .1 All the work identified under this Contract, has been completed.
  - .2 All sites' have been cleaned up and any outstanding deficiencies for the work identified under this Contract have been addressed to the satisfaction of the Departmental Representative.
  - .3 Contractor has removed from the park all trailers and equipment and sites have been cleaned-up to the satisfaction of the Departmental Representative.

### **Part 2 Products**

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

### **Part 3 Execution**

#### **3.1 NOT USED.**

**END OF SECTION**



## **01 31 00 PROJECT MANAGEMENT AND COORDINATION**

### **Part 1 General**

#### **1.1 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 This Work shall be incidental to the Contract and will not be measured for payment.

#### **1.2 CHANGES TO DESIGN**

- .1 If a change from the IFC design is accepted in writing by the Departmental Representative and agreed on by the Contractor, a design variance letter will be issued by the Departmental Representative. The design variance letter must state what changes are being made from the IFC design and what the method of measurement for payment will be, if varying from the Contract Documents.
- .2 The design variance letter must be signed by both the Contractor's Representative and the Departmental Representative prior to performing the Work.
- .3 The Departmental Representative reserves the right to use as-built survey or neat line measurements for payment if for any reason tolerances are not in accordance with the IFC design.

#### **1.3 COORDINATION**

- .1 Perform coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities, and construction Work, with progress of Work of other Contractors, and Work by Owner, under instructions of the Departmental Representative.

#### **1.4 PROJECT MEETINGS**

- .1 During the course of the Work, the Contractor shall attend weekly construction meetings as scheduled, chaired, and documented by the Departmental Representative.
- .2 The agenda will include among other things, general construction, payment, scheduling, risk, quality, environmental, and safety management items as well as any other reasonably requested by the parties.
- .3 The Contractor shall provide physical space and make arrangements for meetings at or near the Work Sites for all meetings that take place in relation to the Contract from their mobilization until their demobilization.
- .4 Meetings held outside of the time noted above (before mobilization or after demobilization) will either be held in the local PCA Field Unit offices, or at the Owner's site office, as notified by the Departmental Representative.
- .5 The Contractor will attend or otherwise ensure the attendance of their staff, subcontractors, consultants, suppliers, or other key parties all other meetings identified in the Contract or reasonably requested by the Departmental Representative in an effort to resolve specific issues as they may arise.
- .6 Meetings will be called and chaired by the Departmental Representative as required. The Contractor shall be represented at such meetings to the satisfaction of the Departmental Representative.
- .7 As described in Section 01 35 43 – Environmental Procedures, an environmental briefing for all staff will take place before beginning work at the site.

## **1.5 CONSTRUCTION ORGANIZATION AND START-UP**

- .1 Within seven (7) days after award of Contract, request a Preconstruction meeting of Contract Representatives to discuss and resolve administrative procedures and responsibilities. Meeting shall be chaired by the Departmental Representative who will prepare the minutes of the meeting.
- .2 Senior representatives of the Owner, Departmental Representative, Contractor, major subcontractors, field inspectors and supervisors are to be in attendance.
- .3 Agenda to include following:
  - .1 Appointment of official representative of participants in Work.
  - .2 Schedule of Work, progress scheduling in accordance with Section 01 32 16 – Construction Progress Schedules.
  - .3 Schedule of submittals in accordance with Section 01 33 00 – Submittal Procedures.
  - .4 Requirements for temporary facilities, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 – Construction Facilities.
  - .5 Site safety and security in accordance with Sections 01 14 00 – Work Restrictions, 01 35 29 – Health and Safety Requirements, 01 52 00 – Construction Facilities and 01 35 43 – Environmental Procedures.
  - .6 Quality Control in accordance with Section 01 45 00 – Quality Control.
  - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
  - .8 Owner-furnished materials.
  - .9 Monthly progress claims, administrative procedures, photographs, and holdbacks.
  - .10 Closeout procedures and submittals in accordance with Sections 01 77 00 – Closeout Procedures and 01 78 00 – Closeout Submittals.
  - .11 Insurances and transcript of policies.
  - .12 Other business.
- .4 Comply with Departmental Representative's allocation of mobilization areas of site, for field offices and sheds, and for access, traffic, and parking facilities.
- .5 During construction, coordinate use of site and facilities through Departmental Representative's procedures for intra-project communications: submittals, reports and records, schedules, coordination of Drawings, recommendations, and resolution of ambiguities and conflicts.
- .6 Comply with instructions of the Departmental Representative for use of temporary utilities and construction facilities.
- .7 Coordinate field engineering and layout work with the Departmental Representative.

## **1.6 ON-SITE DOCUMENTS**

- .1 Maintain at job site, one copy each of the following:
  - .1 Contract Drawings if part of tender
  - .2 Specifications
  - .3 Addenda

- .4 Reviewed Shop Drawings and mix designs
- .5 Change Orders
- .6 Other modifications to Contract
- .7 Traffic Management Plan
- .8 Safety Plan
- .9 WHMIS
- .10 Environmental Protection Plan
- .11 Quality Control Plan and field test reports
- .12 Copy of accepted Work schedule and most recent updated schedule
- .13 Labour conditions and wage schedules
- .14 Equipment rate schedule and applicable versions of the relevant rate guides
- .15 Applicable current editions of municipal regulations and by-laws

## **1.7 PROJECT SCHEDULES**

- .1 In accordance with Section 01 32 16 - Construction Progress Schedules.

## **1.8 SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit requests for payment for review, and for transmittal to Departmental Representative. Payment request on last day of the month.
- .3 Submit requests for interpretation of Contract Documents and obtain instructions through Departmental Representative.
- .4 Process substitutions through Departmental Representative.
- .5 Process change orders through Departmental Representative.
- .6 Submittal Schedule:
  - .1 Prepare a schedule of the required submissions and the date the submissions will be made. Include columns for Actual Date of Submission, Review Comments Received, Final Submission and Final Acceptance Received. Provide this schedule to the Departmental Representative in Excel format.
  - .2 The Owner will not be responsible for any construction delays resulting from delays in submission acceptance if the submittal dates shown in the Submittal Schedule are not achieved.

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 NOT USED.**

**END OF SECTION**

## **01 32 16 CONSTRUCTION PROGRESS SCHEDULES**

### **Part 1 General**

#### **1.1 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 This Work shall be incidental to the Contract and will not be measured for payment.

#### **1.2 DEFINITIONS**

- .1 Activity: An element of Work performed during course of Project. An activity normally has an expected duration and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (Gantt Chart): A graphic display of schedule-related information. In a 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 accepted plan for Project.
- .4 Construction Work Week: Monday to Saturday, inclusive, will provide six-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 an activity or other Project element. Usually expressed as workdays or work weeks.
- .6 Master Plan: A summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: A significant event in Project, usually completion of a major deliverable.
- .8 Project Schedule: The planned dates for performing activities and the planned dates for meeting milestones. A dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: Overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

#### **1.3 REQUIREMENTS**

- .1 Ensure the Project Schedule is practical and remains within specified Contract duration.
- .2 Ensure all the Work required for the Contract is identified in the Project Schedule. Refer to Section 01 11 00 – Summary of Work for a potential list of activities.
- .3 Include an allowance of 20 days in the schedule for Work performed and paid for as Prime Cost Sum. Refer to Section 01 21 00 – Allowances for a list of potential activities.
- .4 Include the requirements of Section 01 14 00 – Work Restrictions and Section 01 35 43 – Environmental Procedures.

- .5 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.
- .6 After review, revise and resubmit schedule to comply with revised project schedule.
- .7 During progress of Work revise and resubmit as directed by the Departmental Representative. If schedule is requested and not received, the Departmental Representative may hold back progress payment until an updated Project Schedule is received and accepted.

#### **1.4 SUBMITTALS**

- .1 In accordance with Section 01 33 00 – Submittals Procedures.
- .2 Submit to Departmental Representative within 10 working days of Award of Contract a Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

#### **1.5 PROJECT MILESTONES**

- .1 Project milestones form interim targets for Project Schedule.
- .2 Include in Project Schedule the Contractual dates under Section 01 11 00 - Summary of Work.

#### **1.6 MASTER PLAN**

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

#### **1.7 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule separately identifies the Work by area and station.
- .3 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Contract Award
  - .2 Obtaining Permits
  - .3 Pre-mobilization Submittals
  - .4 Mobilization
  - .5 Clear & Grubbing
  - .6 Stripping
  - .7 Pavement removal
  - .8 Culvert removal and replacement
  - .9 Embankment construction
  - .10 Pavement structure construction
  - .11 Topsoil placement
  - .12 Asphalt paving

- .13 Shouldering
- .14 Traffic signage & guide posts
- .15 Rumble Strips
- .16 Line painting
- .17 Hydroseeding
- .18 Interim Inspection
- .19 Remediation of any noted deficiencies
- .20 Site Clean-up / Demobilization
- .21 Final Completion

## **1.8 PROJECT SCHEDULE REPORTING**

- .1 Update Project Schedule on monthly basis or as and when requested by the Departmental Representative, reflecting activity changes and completions, as well as activities in progress.
- .2 Provide Weekly Progress Reports that identify completed work and Work planned for the following week in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Include as part of Project Schedule Update, a 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.

## **1.9 PROJECT MEETINGS**

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

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 NOT USED.**

**END OF SECTION**

## **01 33 00 SUBMITTAL PROCEDURES**

### **Part 1 General**

#### **1.1 MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.2 ADMINISTRATIVE**

- .1 Submit to Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause 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 written acceptance of the submittal has been issued by the Departmental Representative.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Submittals must be accompanied by a completed Quality Control Checksheet in accordance with Section 01 45 00 – Quality Control prior to submission to Departmental Representative. This completed Quality Control Checksheet represents that all the necessary requirements have been met and that the 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 shall be considered rejected.
- .6 Notify Departmental Representative in writing at time of submission, identifying any deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work is consistent.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one accepted copy of each submission on site.

#### **1.3 “DESIGN AND BUILD”, SHOP DRAWINGS, PRODUCT DATA, AND MIX DESIGNS**

- .1 “Design and Build”: The term “Design” refers to all detailed design activities (survey, investigation, drawings, specifications) based on general requirements contained in the Contract Documents. “Build” refers to construction of Contractor's detailed design after design has been reviewed by the Departmental Representative. Contractor's responsibility for error and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .2 The term “shop drawings” means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data that are to be provided by the Contractor to illustrate details of a portion of Work.
- .3 The term “Mix Design” means an engineered design for proportioning materials in concrete or asphalt concrete pavement including all supporting test results, materials



properties, that is acceptable to the Departmental Representative. **Asphalt mix design to be performed by a qualified member of the Association of Professional Engineers and Geoscientist who is licenced to practice in Alberta, or by a qualified technician registered in Alberta who has CCIL Asphalt Certification.**

- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of section under which adjacent items will be supplied and installed. Indicate cross-references to Contract Documents.
- .5 Allow fourteen (14) calendar days for Departmental Representative's review of each submission.
- .6 Adjustments made on shop drawings by the Departmental Representative are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Departmental Representative prior to proceeding with the Work.
- .7 Make changes in shop drawings as the Departmental Representative may require, consistent with the Contract Documents. When resubmitting, notify the Departmental Representative in writing of any revisions other than those requested.
- .8 Submit letter(s) of certification with all mix designs.
- .9 Accompany submissions with a transmittal letter containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, mix design, product and sample.
  - .5 Other pertinent data.
- .10 Submissions shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor,
    - .2 Supplier,
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with the Contract Documents.
  - .5 Details of appropriate portions of the Work as applicable:
    - .1 Fabrication,
    - .2 Performance characteristics,
    - .3 Standards.
- .11 After the Departmental Representative's review, distribute copies.
- .12 Submit one (1) electronic copy of the shop drawings or mix design for each requirement requested in the Contract Documents and as requested by the Departmental Representative.

- .13 Submit one (1) electronic copy of the product data sheets or brochures for requirements requested in the Contract Documents and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of the product.
- .14 Delete information not applicable to project.
- .15 Supplement standard information to provide details applicable to project.
- .16 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .17 The review of shop drawings and mix designs by Departmental Representative is for the sole purpose of ascertaining conformance with the Contract requirements. This review shall not mean that Departmental Representative approves details of the design inherent in shop drawings, responsibility for that shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting the generality of the foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

#### **1.4 SAMPLES**

- .1 Material samples to be provided as outlined in the Contract Documents or as requested by the Departmental Representative.

#### **1.5 MOCK-UPS**

- .1 Not used.

#### **1.6 CERTIFICATES AND TRANSCRIPTS**

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

#### **1.7 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**

The Contractor shall submit the following plans and programs to the Departmental Representative for review a minimum of fourteen (14) calendar days prior to preconstruction meeting:

- .1 Project schedule, detailing the schedule of the workdays required from Contractor, subcontractors, suppliers and consultants to complete each activity of the project by road segment or location in order to meet stages specified in Section 01 32 16 – Construction Progress Schedules. In addition, for each

activity critical elements that could impact on the schedule are to be identified. Submission shall include both a paper copy of the schedule and an electronic copy in Microsoft Projects format

- .2 Environmental Protection Plan (EPP) that meets the requirements of Section 01 35 43 – Environmental Procedures. Submission of EPP must allow 2 weeks for review by the Parks ESO, in accordance with Section 01 35 43 – Environmental Procedures.
- .3 Plan describing methods the Contractor will have to meet their responsibilities as the Prime Contractor for Safety and Traffic Control within the Work limits and to co-ordinate Work, traffic control, site access, safety, with other Contractors working in or adjacent to the Contract Work zone.
- .4 Health and Safety Plan - The Contractor shall have a Certificate of Recognition (COR) or Registered Safety Plan (RSP) including a site-specific Health and Safety Plan acceptable to the Departmental Representative. The Contractor shall implement and maintain the Health and Safety Plan during the Work. Where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative. Health and Safety Plan must include in accordance with Section 01 35 29 – Health and Safety Requirements.
  - .1 Contractor shall develop an “Emergency Procedures Protocol” in consultation with Parks Canada. On site Contingency and Emergency Response Plan to address standard operating procedures to be implemented during emergency situations. Emergency Response Plan can be incorporated into the Health and Safety Plan.
- .5 Traffic Management Plan, in accordance with the requirements of Section 01 35 31 – Special Procedures for Traffic Control.
- .6 Quality Control Plan in accordance with Section 01 45 00 – Quality Control, including Quality Control checklist examples for each item of Work.
- .7 Alberta One Call and Utilities Coordination Plan, including notifications to Utility Owners.
- .8 Contractor and any subcontractors to submit a copy of their valid Parks Canada Business License.
- .9 Contractor Chain of Command, listing key Contractor personnel, including for each name, position, qualification, experience, telephone and cellular telephone. The list shall include the names and telephone/cellular telephone for contact persons who are available on a 24-hour basis in the event of emergencies.
- .10 List of subcontractors, suppliers and consultants, their role and their key personnel, including names and positions, addresses, telephone and cellular telephone.
- .11 Work Plan, describing in detail for each activity by road segment and location, the Contractor’s intended methods of construction, and materials, equipment and manpower that will be used to meet stages specified in Section 01 32 16 – Construction Progress Schedules. The Work Plan must be linked to the Project Schedule.

- .12 Schedule of Force Account rates, in accordance with Section 01 21 00 – Allowances.
- .13 Survey Plan describing the Contractor's intended methods of surveying during this project and applicable resumes in accordance with Section 01 71 00 – Examination and Preparation.
- .14 Asphalt Plant provincial registration and records showing compliance with provincial and federal regulations for emission testing and monitoring.
- .15 Pit sourcing information and testing (i.e. Micro-Deval Test).
- .16 The Contractor shall not begin any Work on the Site until the Departmental Representative has provided a Notice to Proceed.
- .3 **Construction Phase Submittals**
  - .1 Monthly Progress Reports in accordance with Section 01 32 16 – Construction Progress Schedules.
  - .2 Weekly Progress Reports that outline the detailed Work (Contractor, subcontractors, suppliers, consultants) completed to date as well as the anticipated Work to be performed for the following week on a day-by-day basis. Work to be linked to activities by road segment or location identified in project schedule and to provide information on materials, equipment and manpower. Also, alternate Work to be identified if Work or a portion of, proposed cannot be done due to weather, equipment breakdown, delays in delivery, etc. Weekly Progress Reports shall be submitted at the end of each week.
  - .3 Quality Control Inspection Reports - The Contractor shall maintain a daily inspection report that itemizes the results of all Quality Control inspections conducted by the Contractor. The reports shall be submitted to the Departmental Representative with the Weekly Progress Report. A summary of all Quality Control inspections conducted to date shall be submitted by the Contractor with each Weekly Progress Report.
  - .4 "Design and Build" documents, Shop Drawings and Mix Designs – The Contractor shall submit all design drawings, shop drawings and mix designs required to fabricate and / or conduct the work a minimum fourteen (14) calendar days prior to fabrication / production.
  - .5 Progress Photographs Format:
    - .1 Electronic: .jpg files, minimum three (3) mega pixels.
    - .2 Submission requirements: one (1) set of electronic files.
    - .3 Identification: Name and number of project, description of photograph and date.
    - .4 Viewpoints: viewpoints determined by Construction Manager or Departmental Representative.
    - .5 Submission Frequency: prior to commencement of Work and weekly thereafter with progress statement, or as directed by Construction Manager or Departmental Representative.
    - .6 Submit all electronic pictures as part of closeout package.
  - .6 Submit an electronic copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.

- .7 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors immediately.
- .8 Submit copies of incident and accident reports immediately.
- .9 Submit daily extra work reports in accordance with Section 01 21 00 – Allowances.
- .4 **Project Completion Submittals**
  - .1 Record Drawings -The Contractor shall submit copies of all Contractor's Drawings revised as necessary to record all as-built changes to the Work and the Contractor shall submit a set of Contract Drawings clearly marked to record as-built changes to the Work.
  - .2 Quality Control Records – The Contractor shall submit a .pdf electronic file containing an itemized set of project quality control documentation.
  - .3 All other documents noted within the Contract Documents, and under Section 01 78 00 – Closeout Submittals.
- .5 The Contractor shall not construe the Departmental Representative's authorization of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Authorization of the programs shall not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal or Provincial regulations and this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor shall remain solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.
- .6 The Departmental Representative may, at their sole discretion, withhold payment from the Contractor for Work completed until acceptable submittal documents have been provided by the Contractor to the Departmental Representative.

**Part 2 Products**

**2.1 NOT USED.**

**Part 3 Execution**

**3.1 NOT USED.**

**END OF SECTION**

## **01 35 29 HEALTH AND SAFETY REQUIREMENTS**

### **Part 1 General**

#### **1.1 REFERENCES**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Health Canada/Workplace Hazardous Materials Information System
  - .1 (WHMIS) Material Safety Data Sheets (MSDS).
- .3 Province of British Columbia / Alberta - Occupational Health and Safety Act, depending on the province where the Work is occurring.

#### **1.2 MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.3 FILING OF NOTICE**

- .1 None.

#### **1.4 SAFETY ASSESSMENT**

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

#### **1.5 MEETINGS**

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work. This meeting may be combined with the Preconstruction meeting identified elsewhere.
  - .1 At this meeting the Contractor is required to complete and sign an Attestation to certify the Contractor will comply with the requirements set out in the Attestation and the terms and conditions of the Contract.
  - .2 A copy of the "Attestation and Proof of Compliance with Occupational Health and Safety (OHS)" form is part of the Invitation to Tender package.
- .2 Parks Canada recognizes that federal Occupational Health and Safety legislation places specific responsibilities upon Parks Canada as owner of the work place. In order to meet those requirements, Parks Canada has implemented a contractor safety regime to ensure roles and responsibilities assigned under Part II of the Canada Labour Code and the Canada Occupational Health and Safety Regulations are implemented and observed when involving contractor(s) to undertake work in Parks Canada work places, including on Parks Canada property.

#### **1.6 REGULATORY REQUIREMENTS**

- .1 Do Work in accordance with the National Parks Act.

#### **1.7 PROJECT / SITE CONDITIONS**

- .1 Work at site will involve contact with British Columbia / Alberta Occupational Health and Safety, depending on which province the Work is occurring in.

## **1.8 GENERAL REQUIREMENTS**

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

## **1.9 RESPONSIBILITY**

- .1 The Contractor shall act as the Prime Contractor in all matters relating to Occupational Health and Safety. They shall conduct their work and make all such arrangements necessary to allow them to be accepted as such by the relevant Provincial Authorities.
- .2 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

## **1.10 COMPLIANCE REQUIREMENTS**

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, British Columbia / Alberta, depending on which province the Work is occurring in.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

## **1.11 UNFORESEEN HAZARDS**

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

## **1.12 HEALTH AND SAFETY REPRESENTATIVE**

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Co-ordinator must:
  - .1 Have minimum 2 years' site-related working experience specific to activities associated with roadway construction.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.



### **1.13 POSTING OF DOCUMENTS**

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

### **1.14 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected. The Contractor shall do as requested at their cost and no claim for time or additional costs will be accepted.

### **1.15 BLASTING**

- .1 Blasting or other use of explosives is not permitted without prior receipt of written approval by the Departmental Representative.
- .2 Production of blasting powder must be done in accordance with Section 01 35 43 – Environmental Procedures.
- .3 Do Blasting operations to be in accordance with Section 31 24 13 – Roadway and Drainage Excavation.

### **1.16 POWDER ACTUATED DEVICES**

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

### **1.17 WORK STOPPAGE**

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

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 NOT USED.**

**END OF SECTION**

## **01 35 31 SPECIAL PROCEDURES FOR TRAFFIC CONTROL**

### **Part 1 General**

#### **1.1 DESCRIPTION**

- .1 Supply, installation, maintenance and removal of Traffic Accommodation for the duration of the Contract or as described in this Section.

#### **1.2 REFERENCES**

- .1 British Columbia - Traffic Control Manual for Work on Roadways (1999)
- .2 AT – Traffic Accommodation in Work Zones (latest edition)
- .3 AT – Traffic Control Standards (latest edition)
- .4 BC MoTI – Standard Specifications for Highway Construction – Traffic Management for Work Zones (latest edition)
- .5 Manual of Uniform Traffic Control Devices for Canada, (MUTCD) distributed by Transportation Association of Canada. (latest edition)

#### **1.3 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Payment for Traffic Control as described in this Section, shall be made under **“Lump Sum Price Item 2 – Traffic Accommodation”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .2 Payment for Traffic Accommodation will be on a monthly basis based on the percent of Contract Works completed, not to exceed the total lump sum bid price for Traffic Accommodation. Extra works are not to be included in determining the percent complete of the Contract.
- .3 Payment for Traffic Accommodation will commence once the Contractor has implemented their accepted Traffic Management Plan and setup is accepted by the Departmental Representative.
- .4 Items considered incidental to the Work include, but are not limited to:
  - .1 Installation and removal of temporary pavement markings as described in the Contract Documents.
  - .2 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
  - .3 Keeping the existing roadway within the Work limits, clean, free of pot holes while Contractor is on site.
  - .4 Repairing pot holes in within the Work limits during Winter Shutdown.
  - .5 Cost of snow removal required by the Contractor to complete the work identified in the Contract.
- .5 The Contractor shall not be responsible for the snow removal required for general highway road maintenance operations within the limit of construction so long as the roadway has been left in a condition deemed suitable, by Departmental Representative, for maintenance crews to safely complete the work.

#### 1.4 GENERAL

- .1 The Contractor will not be permitted to remove the temporary pavement marking until the final pavement markings have been installed to the satisfaction of the Contract and Departmental Representative.
- .2 At all work sites, the Contractor shall mark **accurately**, at regular intervals, the location and type of existing painted lines prior to their removal or covering, including start and ends of passing lanes and intersections, with a stake at the side of the roadway and make a written record of markings in a book, in order that painted lines can be accurately re-established after work is completed. If no lines are present the Contractor shall mark **accurately (+ or – 20 mm)** and at regular intervals in accordance with the Section 2.2.1 of the **“BC MoTI - Traffic Control Manual for Work on Roadways, 1999”**.
- .3 The Contractor shall develop and implement a Traffic Management Plan in accordance with AT – Traffic Accommodation in Work Zones (latest edition), except where specified otherwise in the Contract Documents. The Traffic Management Plan will include plans specific to each roadway for this project.
- .4 The Traffic Management Plan must duly consider the traffic volumes associated with the direction volume increases typically experienced on the lead up to weekends and/or special events. Adjustments to the TMP may be required at the request of the Departmental Representative to mitigate delays in excess of the stipulated maximum 20 minutes.
- .5 The Contractor shall design, supply, erect, move and maintain all traffic control devices, signs, temporary pavement marking, other safety measures and provide staff to ensure safe passage of all traffic from commencement of site work to date of acceptance by the Departmental Representative.
- .6 The Contractor shall supply, install and maintain minimum 2 Flashing Arrow Boards (FAB), as required for the Works, in accordance with the accepted TMP. All FAB shall be as per MUTCD (latest edition). Exact installation locations of FABs to be agreed on site with the Departmental Representative. All cost associated with the supply, installation, maintenance and removal of FABs will be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**. Removal will only be permitted upon completion of the Works.
- .7 The Contractor shall supply, install and maintain minimum 2 Portable Changeable Message Signs (CMS) to inform the traffic of construction delays. All CMS shall be as per MUTCD (latest edition) and shall be in both English and French with equal space allotted to each. Exact installation locations of the CMS to be agreed on site with the Departmental Representative. All cost associated with the supply, installation, maintenance and removal of the CMS will be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**. Removal of the CMS will only be permitted upon completion of the Works.
- .8 The Contractor shall supply, install and maintain minimum 2 speed reader boards (SRB), as required for the Works. Exact installation locations of SRBs to be agreed on site with the Departmental Representative. All cost associated with the supply, installation, maintenance and removal of SRBs will be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**. Removal will only be permitted upon completion of the Works.
- .9 All traffic and warning signs shall be either bilingual or of a symbolic or pictorial type. All signs are to be selected from the Construction Signage Translation Database provided in the Contract Documents.

- .10 All Changeable Message Sign (CMS) messages are to be selected from the preapproved database provided and are to be bilingual as shown.
  - .1 Any signage requiring translation that is not shown in the standard translation Contract Document must be approved by Parks Canada prior to fabrication.
- .11 Temporary pavement marking used shall be acceptable to the Departmental Representative and in accordance with Section 2.2.1 of the BC MoTI Traffic Control Manual for Work on Roadways, 1999. Spacing between temporary line markings to not exceed 10m.
- .12 All temporary pavement markings will be removed at the Contractor's expense prior to the completion of the Contract.
- .13 Temporary lane markings that are not consistent with the final geometric design layout shall be removed using eradication or water blasting to the satisfaction of the Departmental Representative. Blackout painting of existing lines will not be permitted. No additional payment will be made for removal of existing paint lines.
- .14 Contractor shall have appropriate traffic control measures in place so that one (1) lane of highway traffic is maintained in each direction through the work zone at all times throughout the construction.
- .15 The Contractor shall coordinate traffic management procedures with other Contractors working in the immediate vicinity as well as collaborate with the Departmental Representative in respect to Traffic Management restrictions on the Highway Network. In consideration of the number of grading, paving and bridge construction projects in the corridor the Contractor must make a concerted effort to coordinate their traffic management strategies with other stakeholders. The Contractor must also be prepared to attend traffic management and construction staging coordination meetings as requested by the Departmental Representative.
- .16 The Contractor is responsible for keeping the roadway, within the Construction Limits, clean at all times. Sweeping, grading and/or dust control to the acceptance of the Departmental Representative is considered incidental to the Contract and no additional payment will be made.

## **1.5 PROTECTION OF PUBLIC TRAFFIC**

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 Carry out traffic regulation in accordance with AT – Traffic Accommodation in Work Zones (latest edition), except where specified otherwise.
- .3 When working on existing travelled way:
  - .1 Place equipment in a position presenting a minimum of interference and hazard to traveling public.
  - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
  - .3 Do not leave equipment on travelled way overnight.
- .4 The Contractor shall develop and have in place a completed Traffic Management Plan taking into account all hazards associated with construction operations on a busy highway and minimize risks to motorists prior to beginning Work. This plan shall be

- updated regularly in response to any incidents or changes in conditions, be they weather, work, traffic, or otherwise.
- .5 The Contractor shall submit a Traffic Management Plan prior to commencement of work. Short closures may be allowed by the Departmental Representative for some activities such as asphalt removal as long as the delay to motorists does not exceed **20 minutes**.
  - .6 Do not close any lanes of road without approval of Departmental Representative. Before re-routing traffic erect suitable signs and devices in accordance with the requirements of the AT – Traffic Accommodation in Work Zones (latest edition), except where specified otherwise.
  - .7 Contractor to provide a minimum of 10.0m wide available paved surface for traffic, with at least one (1) lane in each direction, unless otherwise authorized by the Departmental Representative.
  - .8 Regardless of type of traffic control being used, maximum period of delay to public traffic shall be 20 minutes. Emergency vehicles (i.e., ambulance, RCMP, Park Warden) must be granted immediate passage at all times. The Departmental Representative reserves the right to reduce delay time for public traffic at times when specified delay results in excessive backup of public traffic.
  - .9 The Contractor shall provide competent supervision and/or contact personnel as required during non-working hours to ensure that safety flares, flashing beacons, signs, lights, etc., are in proper working order.
  - .10 Traffic control measures will be monitored by the Departmental Representative, who may require modifications of these measures from time to time to achieve satisfactory traffic flow, safety of traveling public and coordination with adjacent contracts.
  - .11 The Contractor shall maintain a dust free construction zone by means of cleaning and watering when required.

## 1.6 INFORMATIONAL AND WARNING DEVICES

- .1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work that requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in the Traffic Management Plan submitted by the Contractor and approved by the Departmental Representative. **All temporary signs that are used for longer than one day shall be mounted on wood or steel posts installed in the shoulder areas at locations accepted by the Departmental Representative.**
- .3 At each end of the Work site, supply, install and maintain CMS's with a minimum of three (3) lines with eight (8) characters for the duration of the project.
- .4 Place signs and other devices to standards and in locations recommended in AT – Traffic Accommodation in Work Zones (latest edition). Provide intermittent signage if work zones exceed 2.0 km in length.
- .5 All construction signs shall be installed to prevent incidental blow down or displacement and must remain in service throughout the construction period. Construction signage heights to be minimum 1.5m from ground to the bottom of the sign, or as per AT – Traffic Accommodation in Work Zones (latest edition), whichever is higher.

- .6 As situation on site changes, Contractor to update their Traffic Management Plan outlining signs and other devices required for the project and submit for the acceptance of the Departmental Representative.
- .7 Continually inspect and maintain traffic control devices in use by:
  - .1 Checking signs daily for legibility, damage, suitability, location and height.
  - .2 Cleaning, repairing or replacing signs as required ensuring clarity and reflectance.
  - .3 Removing or covering signs that do not apply to conditions existing from day to day or time to time.

## 1.7 CONTROL OF PUBLIC TRAFFIC

- .1 Contractor shall provide competent flag persons, trained in accordance with, and properly dressed and equipped as specified in AT – Traffic Accommodation in Work Zones (latest edition).
  - .1 When public traffic is required to pass working vehicles or equipment, that block all or part of travelled roadway.
  - .2 When vehicles are entering or exiting Work Site access points.
  - .3 When vehicles are entering or exiting gravel pits in the park.
  - .4 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
  - .5 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
  - .6 Where temporary protection is required while other traffic control devices are being erected or taken down.
  - .7 For emergency protection when other traffic control devices are not readily available.
  - .8 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
  - .9 At each end of restricted sections where pilot cars are required.
- .2 Delays to public traffic due to Contractor's operations: **maximum 20 minutes**.
- .3 During hours of darkness, Contractor shall determine requirements but as a minimum, flag persons shall be additionally equipped with a red signal hand-light of sufficient brightness to be clearly visible to approaching traffic and flagging stations shall be illuminated by overhead lighting. Signs indicating hazardous conditions and signs requiring increased attention shall be marked with flashers.
- .4 No stoppage of traffic will be allowed for the periods specified in Section 01 14 00 – Work Restrictions, pertaining to Statutory Holiday or long weekend.
- .5 If night shift operations are implemented on 2-lane undivided sections, the public traffic must be escorted through the work zone by pilot cars in both directions.

## 1.8 OPERATIONAL REQUIREMENTS

- .1 Maintain existing conditions for traffic throughout period of Contract except that, when required for construction under Contract and when measures have been taken as



specified herein and approved by Departmental Representative to protect and control public traffic, existing conditions for traffic to be restricted as follows:

- .1 Speed limit reduced to 70 km/h in work zones in non-work periods.
- .2 Speed limit reduced to 50 km/h in work zones in work periods.
- .3 Speed limit reduced to 50 km/h on detours at all times.
- .4 Contractor to provide a minimum of 10.0m wide available paved surface for traffic, with at least one lane in each direction, unless otherwise authorized by the Departmental Representative.
- .5 The delay due to single lane alternating traffic shall not exceed 20 minutes.
- .6 A schedule for all full work zone closures required longer than 45 minutes must be provided to the Departmental Representative at least one (1) week in advance of the planned closure.
- .7 There may be restrictions to accommodate special events within the National Parks. PCA will provide two (2) weeks' notice of any upcoming restrictions.
- .8 The Departmental Representative reserves the right to stop work in the case of excessive traffic delays. The Contractor shall do as requested at their cost and no claim for time or additional costs will be accepted.
- .9 Maintain existing conditions for traffic crossing right-of-way.
- .10 Provide the Departmental Representative with construction advisories for posting to the Official Alberta Traffic Advisor website (<http://511.alberta.ca/>) and update advisories regularly to reflect the current and planned construction activities and highway closures. A minimum of 4 days notice is required for changes to the accepted TMP.
- .11 Emergency vehicles are to be directed through the Work Site immediately once conditions are safe.
- .12 No stoppage of traffic shall be allowed during inclement weather conditions.
- .2 Maintain existing conditions for traffic crossing right-of-way.
- .3 No stoppage of traffic shall be allowed during inclement weather conditions.

## **1.9 QUALITY CONTROL**

- .1 In accordance with Section 01 45 00 - Quality Control.

## **1.10 SUBMITTALS**

- .1 In accordance with Section 01 33 00 Submittal Procedures.

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 NOT USED.**

**END OF SECTION**



## **01 35 43 ENVIRONMENTAL PROCEDURES**

### **Part 1 General**

#### **1.1 REFERENCES**

1. Parks Canada National Best Management Practices – Roadway, Highway, Parkway and Related Infrastructure, May 2015
2. Pratiques exemplaires nationales de gestion de Parcs Canada - Routes, autoroutes, promenades et infrastructure connexe – Mai 2015
3. Whirling Disease in Banff National Park (BNP), Alberta – Direction for Permitted Users conducting water-related activities in BNP – October 2016.
4. Tournis des truites – Unité de gestion du secteur de Lake Louise et des parcs nationaux Yoho et Kootenay – avril 2017

#### **1.2 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 This Work shall be incidental to the Contract and will not be measured for payment.
- .2 Preparation and implementation of an Environmental Protection Plan (EPP) in accordance with this Section 01 35 43 – Environmental Procedures, including certification by a registered Qualified Environmental Professional (QEP), will not be measured separately for payment and will be considered incidental to the Work.

#### **1.3 SUBMITTALS**

- .1 The Contractor is required to prepare and submit an Environmental Protection Plan in accordance with this Section 01 35 43 – Environmental Procedures and Section 01 33 00 – Submittal Procedures. The EPP document will be reviewed and accepted for use on the project by the Departmental Representative in collaboration with the Parks Canada designated Environmental Surveillance Officer (ESO).

#### **1.4 NATIONAL PARK REGULATIONS**

- .1 The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
- .2 The Contractor and any sub-contractors shall obtain a business license from a Parks Canada Administration Office, prior to commencement of the Contract. The business license must be valid for the Park in which the Work is occurring.
- .3 All Contractor's vehicles are required to display a vehicle work pass from PCA. These permits may be obtained free of charge from the PCA Administration Office once a business permit has been obtained.

#### **1.5 IMPACT ASSESSMENT ACT (IAA)**

- .1 Execution of the work is subject to the provisions within the *Impact Assessment Act* (IAA 2019).
- .2 The Contractor is required to implement all recommendations and mitigations and follow all procedures and processes whether supply, construction, administration or

otherwise as described in particular in this Section 01 35 42 – Environmental Procedures, BMPs, and all Contract Documents.

- .3 The Contractor shall prepare their Environmental Protection Plan (EPP) to implement the mitigations identified in this Section 01 35 42 – Environmental Procedures, BMPs, and all Contract Documents as a minimum but shall ensure that all environmental requirements under the Contract and associated with the Works are appropriately managed through their EPP processes.
- .4 Where there is a discrepancy or inconsistency between this Section 01 35 43 – Environmental Procedures and other documents, this Section takes precedence over other documents.
- .5 Failure to comply with or observe environmental protection measures as identified in the Contract Documents may result in the work being suspended pending rectification of the problems. The Contractor shall do as requested at their cost and no claim for time or additional costs will be accepted.

## 1.6 ENVIRONMENTAL BRIEFING AND ESO

- .1 **All staff employed at the construction site will be required to attend an approximate one (1) hour environmental briefing presented by PCA prior to their commencement of work on site.** It is recognized that new employees may join the Contractors' work force after the initial round of "environmental briefing". In that case and as required, subsequent "environmental briefings" can be presented as numbers warrant, by arrangement with the ESO through the Departmental Representative. Also, some sub-trades may be present at the site for a short time, to perform once-only duties. In these cases, the "environmental briefing" will be replaced by the Contractor explaining the environmental sensitivity of the work location to the sub-trade worker(s), and reviewing highlights of personal conduct expected, with reference to a one-page briefing summary to be provided to the Contractor by the ESO. A copy of this summary will be provided to each sub-trade worker joining the work force at the site.
- .2 Parks Canada will have an ESO attending the site to inspect the construction activity for conformance with the EPP. The ESO or alternate designated Parks Canada staff member will present the "environmental briefing". The ESO's main duties are to inspect the progress of the construction on an on-going basis to ensure compliance with environmental protection measures, and to provide guidance through the Departmental Representative, in the event of unanticipated environmental problems. Although the ESO has authority to enforce National Parks Act violations, direction to the Contractor will be the duty of the Departmental Representative.
- .3 The ESO is not to act as daily environmental monitor but shall check activities with the approved EPP to ensure compliance, at their discretion.
- .4 The Contractor's QEP shall be responsible for ensuring all activities are conducted in accordance with the Contract Documents.

## 1.7 ENVIRONMENTAL PROTECTION PLAN

- .1 The EPP is to be prepared certified by a Qualified Environmental Professional. Certification by a QEP is considered incidental to the Works and no additional payment will be made.

- .2 Changes and/or revisions to the EPP may be required by the ESO as the Work progresses and more information becomes available. No additional payment will be made for changes and/or revisions to the EPP.
- .3 The Contractor's EPP will detail how the work limits shall be marked and what procedures will be employed to ensure trespass outside these limits does not occur, to the satisfaction of the Departmental Representative and the ESO.
- .4 The EPP will include how the Contractor will manage all environmental risks and specify site-specific details for implementing mitigation or achieving mitigation outcomes identified in particular in this Section 01 35 42 – Environmental Procedures, BMPs, and all Contract Documents.
- .5 Spill Response and Erosion and Sedimentation Management Plans are to be included in the EPP, in accordance with this Section.
- .6 QEP resumes are to be included in the EPP for Departmental Representative and ESO review.
- .7 The Contractor shall submit the EPP in accordance with Section 01 33 00 – Submittal Procedures yet **allow no less than 2 weeks for the review of their EPP** and shall address and respond to all comments raised during the review within a maximum of 2 weeks.

## 1.8 RESTRICTED ACTIVITY PERMITS

- .1 Prior to commencing any activity, the Contractor may be required to first obtain a Restricted Activity Permit (RAP) in consultation with PCA and Departmental Representative.
- .2 Prior to mobilization, Contractor is to establish what RAPs are required for the Works, for the duration of the project. Include, in the project schedule, the acquisition of the application for RAPs, allowing no less than 2 weeks for review and acceptance by the ESO.
- .3 Contractor shall list RAPs they require in the EPP.
- .4 The Contractor is required to submit an application form to the Departmental Representative for each required RAP.
- .5 RAP application details include, but are not limited to: Name of activity, start and end date of activity, location of Work, Contractor company name and address, Contractor contact name, phone number and email address and vehicle / equipment information.
- .6 Following the application submission, the Contractor may be required to provide further details regarding the Work to PCA.
- .7 Submission of a RAP application to the Departmental Representative does not permit the Contractor to commence the restricted activity.

## 1.9 CONSTRUCTION SITE ACCESS AND PARKING

- .1 Points of access from the existing roadway to the various construction sites will be required. The Contractor shall review both short and long-term construction access requirements with the Departmental Representative, both at start-up and on an ongoing basis. In consultation with the Departmental Representative, the Contractor shall formulate an agreement for worker transportation to and from the work sites and where workers shall park their private vehicles.

- .2 The Contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by workers' vehicles or construction machinery and shall instruct workers so that the "footprint" of the project is kept within defined boundaries.

#### **1.10 ACCIDENTAL FINDS**

- .1 It is possible that a scattering of historic objects will be found within the Project limits. If significant features are encountered, stop Work in the immediate area, notify the Departmental Representative, take photographs of the findings and a GIS location reading.
- .2 Significant features include items such as:
  - .1 Structural remains, high artifact concentrations, tent platforms, log cribbing retaining features, human remains, marked trees and other various items.
  - .2 If unsure, contact the Departmental Representative immediately.
- .3 The Departmental Representative will notify the Contractor when Works can resume in the area.
- .4 Should any process or requirements regarding archeological matters listed in this Section contradict the BMPs and other Contract Documents, this Section shall take precedence.

#### **1.11 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES**

- .1 A RAP application will be required for any permitted Work camps or off-highway operation of a motor vehicle.
- .2 A Contractor's office and work headquarters material laydown, equipment parking and storage area will be permitted in accordance with this Section and Section 01 14 00 - Work Restrictions.
- .3 Removal and storage of snow shall be in accordance with Section 01 35 31 - Special Procedures for Traffic Control. If coordination is required, the Contractor shall coordinate through the Departmental Representative.
- .4 The Contractor shall control blowing dust and debris generated from the construction site by means such as covering or wetting down dry materials and rubbish. Dust generated during the grade construction and or utilization of any temporary access roads must be kept at a reasonable level so as not to impart any hazard to the public traffic. Control measures must be initiated as and when required and may require increased vigilance at the discretion of the Departmental Representative.

#### **1.12 SPECIFIC CONCERNS RELATIVE TO EROSION CONTROL AND SEDIMENTATION**

- .1 The Contractor's QEP shall prepare an Erosion and Sedimentation Management Plan (ESMP) for the components of the Contract that are undertaken in proximity to watercourses, wetlands or riparian environments. The plan shall be included in the EPP and prepared to the satisfaction of the Departmental Representative and ESO.
- .2 The ESMP shall be prepared so as to ensure that there is no release into watercourses of sediments in levels that are deleterious to fish or that would harmfully alter, disrupt, or destroy fish habitat. Similarly, there is to be no sediment release into areas of vegetation growth or sensitive areas of sediments in levels that would adversely alter growing or

hydraulic conditions. The target is 0 mg/L of TSS over background levels. The threshold is a maximum instantaneous increase of 25 mg/L over background levels when background levels are <250 mg/L, or a maximum instantaneous increase of 10% over background levels when background levels are >250 mg/L. This threshold shall not be exceeded.

- .3 If necessary, on-site sediment control measures shall be constructed and functional prior to initiating construction activities.
- .4 The regular monitoring and maintenance of all erosion control measures shall be the responsibility of the Contractor. If the design of the control measures is not functioning effectively they are to be repaired. The Departmental Representative and ESO also will monitor erosion control performance.
- .5 The site will be secured against erosion during any periods of construction inactivity or shutdown.

### 1.13 POLLUTION CONTROL

- .1 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 watercourses.
- .2 A Spill Response Plan will be prepared by the Contractor's QEP 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 PCA 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, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement and sand blasting agents.
- .3 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 watercourses.
- .4 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.
- .5 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.
- .6 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.

- .7 Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. Parks Canada Dispatch shall be notified immediately of any spill immediately and can be contacted at a phone number provided in the Preconstruction Meeting. Following notification of Parks Canada Dispatch, the Departmental Representative and the ESO shall be notified. Spill response cards will be distributed during the initial Environmental Briefing with basic instructions and phone numbers.
- .8 In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- .9 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.

#### **1.14 EQUIPMENT MAINTENANCE, FUELLING AND OPERATION**

- .1 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) outside the National Parks before delivery to the work site.
- .2 Equipment fuelling sites will be identified by the Contractor and approved by the Departmental Representative and the ESO. Except for chain saws, any fuelling closer than 100 metres any streams, wetlands, water bodies or waterways shall require the authorization and oversight of the Departmental Representative.
- .3 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.
- .4 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage sites is addressed above.
- .5 Equipment used on the project shall be fuelled with E10, and low sulfur diesel fuels and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of vehicles is avoided.
- .6 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 within the National Parks.
- .7 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order.
- .8 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 the National Parks. Alternatively, the Contractor may hire a security person employed to prevent vandalism in accordance with Section 01 52 00 - Construction Facilities.

#### **1.15 OPERATION OF EQUIPMENT**

- .1 Equipment movements shall be restricted to the 'footprint' of the construction area. The work limits shall be identified by stake and ribbon or other methods approved by the Departmental Representative. Unless authorized by the Departmental Representative, activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities. Some of the construction shall require working close to watercourses or water bodies. In these instances, the Contractor is to describe measures to be employed to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) do not enter any watercourses, to the satisfaction of the Departmental Representative and ESO.
- .2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the trees bordering the right-of-way or into watercourses or water bodies.
- .3 When, in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc., to the satisfaction of the Departmental Representative and ESO.
- .4 Restrict vehicle movements to work limits.
- .5 Workers private vehicles are to remain within the construction footprint.

#### **1.16 FIRE PREVENTION AND CONTROL**

- .1 A fire extinguisher shall be carried and available for use on each machine and at locations within the plant in the event of fire. Basic firefighting equipment recommended (e.g. a water truck; minimum 500 Imperial gallons with 500 feet of fire hose and a pump capable of producing 45 psi water pressure at the nozzle, 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 all the Contractors' staff.
- .2 A water truck may be necessary and will depend on the timing of the Contract (e.g. not required during winter or snow covered conditions).
- .3 Construction equipment shall be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.
- .4 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented. Fires or burning of waste materials is not permitted.
- .5 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. Parks Canada Dispatch shall be notified immediately of any fire immediately and can be contacted at a phone number provided in the Preconstruction Meeting. Following notification of Parks Canada Dispatch, the Departmental Representative and the ESO shall be notified.



- .6 Fires or burning of waste materials is not permitted.

#### **1.17 WILDLIFE**

- .1 During the Environmental Briefing all personnel shall be instructed by the ESO on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns.
- .2 Avoid or terminate activities on site that attract or disturb wildlife and vacate the area and stay away from the immediate location if bears, cougars, wolves, elk or moose display aggressive behaviour or persistent intrusion. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times.
- .3 Notify the ESO and Departmental Representative immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the site or crew accommodation. Other wildlife-related encounters are to be reported within 24 hours. If the ESO or Departmental Representative is not available, Parks Canada Dispatch will be contacted at a phone number provided in the Preconstruction Meeting.

#### **1.18 RELICS AND ANTIQUITIES**

- .1 Artifacts, relics, antiquities and items of historical interest such as cornerstones, commemorative plaques, inscribed tablets and similar objects found on the work site shall be reported to the ESO or the Departmental Representative immediately. The Contractor and workers shall wait for instructions before proceeding with their work.
- .2 All historical or archaeological objects found in the National Parks are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found and request direction from the ESO or the Departmental Representative.

#### **1.19 WASTE MANAGEMENT AND DISPOSAL**

- .1 The Contractor and workers shall dispose of 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.
- .2 All wastes originating from construction, trade, hazardous and domestic sources, shall not be mixed, but will be kept separate.
- .3 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in the National Parks. These wastes shall be contained and removed in a timely and approved manner by the Contractor and workers and disposed of at an appropriate waste landfill site located outside the Park. Construction waste storage containers, provided by the Contractor, shall be emptied by the Contractor when 90% full. Waste containers will have lids, and waste loads shall be covered while being transported.
- .4 A concerted effort shall be made by the Contractor and workers to reduce, reuse and recycle materials.
- .5 All efforts to prevent wildlife from obtaining food, garbage or other domestic wastes shall be made by the Contractor and Contract staff while undertaking their work in the National Parks. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely

stored away from access by animals. Daily removal of food scraps, food wrappers, pop cans or other attractive products to bear proof containers is mandatory. It is incumbent on the Contractor to notify Parks Canada and make specific arrangements to have garbage collected by Parks Canada when using existing Parks Canada receptacles.

- .6 The Contractor and workers shall immediately report any circumstances related to food/garbage (e.g. overflowing container or strong smell) and wildlife to the ESO or the Departmental Representative. If neither can be reached, the Contractor/worker shall immediately contact Parks Canada Dispatch at the phone number provided in the Preconstruction Meeting and report the details.
- .7 Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition.

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 INSTREAM WORK**

- .1 In accordance with this Section, Section 01 14 00 – Work Restrictions, the National BMPs and all Contract Documents.
- .2 A QEP hired by the Contractor will provide surveillance while working within 30 metres of a watercourse and during an instream works, in accordance with the Contract Documents. The QEP services are considered incidental to the Work and no additional payment will be made.
- .3 The period of least risk for instream works is as listed in the Contract Documents.

### **3.2 WATER EXTRACTION AND DISTRIBUTORS**

- .1 All water related activities are to be conducted in accordance with *Direction for Permitted Users conducting water-related activities in Alberta*.
- .2 Backflow prevention is required on all water trucks.
- .3 All water trucks and water extraction equipment must be thoroughly cleaned prior to entering any Park. Proof of cleaning must be provided to the Departmental Representative and ESO for verification.
- .4 Extraction of water within any National Park requires a RAP.
- .5 Care must be taken by the Contractor to ensure extracted water does not enter another water body, other than the initial source of extraction.
- .6 ESO may require water trucks to be cleaned prior to moving between sites within the Parks to mitigate the risk of cross- contamination of water bodies.

### **3.3 CLEARING AND GRUBBING**

- .1 Clearing, grubbing and/or tree removal is only permitted during the migratory bird least risk window, which is August 31 – April 15 in Jasper National Park. A RAP must be obtained prior to any vegetation removal. Clearing, grubbing and/or tree removal will

only be permitted outside of the migratory bird least risk window upon written approval by the Departmental Representative.

### **3.4 SPECIFIC CONCERNS RELATIVE TO SENSITIVE SITES AND ACTIVITIES**

- .1 Grade construction and paving activity near streams, rivers, wetlands, water bodies or watercourses must be undertaken with care to prevent damage to aquatic and riparian habitat or associated tree and plant communities. A large and mobile spill kit shall be kept at hand during construction at these sensitive sites in proximity to watercourses.

**END OF SECTION**

## **01 45 00      QUALITY CONTROL**

### **Part 1    General**

#### **1.1      REFERENCES**

- .1      Canadian Standards Association (CSA)
  - .1      CAN/CSA-A23.2-04, Methods of Test and Standard Practices for Concrete
- .2      AT - Standard Specifications for Highway Construction (latest edition)

#### **1.2      MEASUREMENT AND PAYMENT PROCEDURES**

- .1      All Quality Control is to be done by the Contractor.
- .2      This work shall be incidental to the Contract and will not be measured for payment.

#### **1.3      QUALITY CONTROL PLAN**

- .1      Contractor's Quality Control Plan shall be in accordance with AT - Standard Specifications for Highway Construction (latest edition).
- .2      Submittals in accordance with Section 01 33 00 – Submittals Procedures.

#### **1.4      TESTING BY THE CONTRACTOR**

- .1      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      Testing all structural concrete, grout, reinforcing steel, asphalt concrete pavement, structural backfill, corrugated steel culverts, miscellaneous metals, concrete barriers, and all source acceptance testing; and
  - .2      All testing specified in the Contract Documents; and
  - .3      Any other testing required as a condition for deviation from the specified Contract procedures.
- .2      Testing proposed shall be based on testing requirements in the latest edition of the AT Standard Specifications for Highway Construction in collaboration with current ASTM and CSA Standards or as stated below.
- .3      All Quality Control technicians are to be certified by Canadian Council of Independent Laboratories (CCIL) for testing asphalt, aggregates and concrete, as applicable to the testing requirements for that item of Work.
- .4      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.

- .5 Approval of tested samples will be for characteristics or use named in such approval and shall not change or modify any Contract requirements.
- .6 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
- .7 The minimum frequency for Quality Control testing during embankment construction will be as follows:

CONSTRUCTION TYPE	TEST TYPE	MINIMUM FREQUENCY OF TESTS
Embankment construction with fine grained or granular soil	Standard Proctor by: ASTM D698	1 per change in material or 1 per week, whichever is more frequent
	Field density by: ASTM D1556 / D1556M – Sand Cone ASTM D2167 – Balloon ASTM D6938 – Nuclear	1 per 1000 m <sup>2</sup> per lift, spaced randomly across full width of embankment
	Proof Roll and or Rutting Test	As required by the Departmental Representative
Embankment construction with blasted rock or oversize granular	Field observation with daily field report; and a summary report signed and stamped by the Contractor's Engineer.	Full time during blasted rock placement
Road structure construction with granular materials	Standard Proctor by: ASTM D698	1 for each material type and 1 for each accepted change in material gradation.
	Field density by: ASTM D1556 / D1556M – Sand Cone ASTM D2167 – Balloon ASTM D6938 – Nuclear	3 tests per 50 m per lift; on centreline and on lt and rt fog lines
	Proof Roll and or Rutting Test	As required by the Departmental Representative
Culvert Installation	Field Density	Minimum three per 300 mm lift per culvert, spaced through the length and depth of the culvert backfill

	ASTM Test	*Minimum Frequency
Tests During Aggregate Production	ASTM C136 / C136M – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates	- Split Stockpiles: 1 for each stockpile for every 2 hours of production.  - One main stockpile: for every 300 tonnes.
	Or  C 117 – Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing	- Blend Sand: 1 for every 100 tonnes during stockpiling.  - Natural filler: 1 for every 50 tonnes during stockpiling.
Tests During Aggregate	ASTM D5821 – Standard Test Method for Determining	Every second coarse aggregate sieve test

Production (cont.)	the Percentage of Fractured Particles in Coarse Aggregate	
	C 117 – Sieve Analysis of Aggregates by Washing (Modified for Field Lab)	1/shift on reduced sample obtained from combined samples from the crusher
Asphalt Products Tests	Tack and Prime	Mill certifications.
Tests during Asphalt Plant Mixing	C 136 / C 136M – Dry Sieve Analysis of Aggregate	1 of combined aggregate (off the belt) every 300 tonnes.
	D 2216 – Moisture Content	Aggregate: 2 tests/Lot  Asphalt mix: 1 on first Sub-Lot and every second day.
	C 117 – Sieve Analysis of Aggregates by Washing (Modified for Field Lab)	1/shift on reduced sample obtained from combined samples from the plant cold feed.
	D 5581 – Resistance to Plastic Flow Using Marshall Apparatus	One set of three briquettes for 1,200 tonnes or Lot, whichever is less.
	D 6307 – Asphalt Extraction, Ignition Method	One/Sub-Lot.
	D 5 / D 5M – 13 Penetration of Bituminous Materials	One per Manufacturer's Batch. Samples should be taken for every 3000 tonnes of mix production.
	D 2171 / D 2171M –Viscosity	Contractor's Option
	D 2041 / D 2041M – Maximum Theoretical Density	One per sub-lot
Test During Asphalt Paving for Density Testing	AASHTO T 245- Resistance to Plastic Flow Using Marshall Apparatus	One 15 kg sample for every Sub-Lot or minimum 1/day for field testing.
	Core Samples	At start, two cores for each Sub-Lot. After rolling pattern established, only one core for each Sub-Lot. All Marshall mix cores to be a minimum of 100 mm diameter, Superpave mixes shall require minimum 150 mm diameter cores.

*\*These are the minimum frequencies and the Contractor is responsible to assess the need to increase testing frequency, where aggregate source is not uniform or any other condition exists that may warrant it. QC frequencies may be reduced below this level, subject to the Departmental Representative's authorization, should the Contractor's QC plan be proven very effective.*

*\* Passing the minimum quantity of QC tests does not relieve the Contractor from the obligation of meeting the Contract requirements and any identified non-compliant works or products shall be rectified by the Contractor at their cost.*

## 1.5 CONTRACTOR'S QUALITY CONTROL PROGRAM

- .1 The Contractor shall prepare a Quality Control Program. The purpose of the program shall be to ensure the performance of the Work in accordance with Contract requirements.

- .2 The Quality Control Program shall be described in a Quality Control Plan. The Contractor shall submit the Manual to the Departmental Representative for review in accordance with Section 01 33 00 - Submittal Procedures. The Manual shall develop a logical system for tracking and documenting the Quality Control of the Work. A systematic format and a set of procedures patterned on a recognized Quality Control Standard will be acceptable, subject to review by the Departmental Representative.
- .3 The Quality Control Plan shall include the following information:
  - .1 Distribution list, providing a list of names to whom the Manual shall be distributed;
  - .2 Title page, identifying the Contract, Contractor and copy number;
  - .3 Revision page, identifying the revision number and date of the Manual;
  - .4 Table of contents;
  - .5 Revision control, tabulating the revision number, date of revision, description of revisions and authorized signature;
  - .6 Details of measuring and testing equipment including methods and frequency of calibration;
  - .7 Purchasing details of all materials and equipment including procurement documents and vendor's Quality Control Program standards;
  - .8 Procedures for inspection of incoming items, in-process inspection and final inspection and tagging of all supply items;
  - .9 Details of special processes as identified by the Departmental Representative, including qualifications of personnel and certification;
  - .10 Procedures for shipping, packaging and storage of materials;
  - .11 Procedures for maintaining quality records and Statements of Compliance, including filing and storage of documents for a period of one year after Completion of the Works;
  - .12 Details of any non-conformance, including identification and recording of deficiencies, tagging procedures for "HOLD" or "REJECT" items, and final disposition of non-conformance forms by the Quality Control Manager;
  - .13 Inspection and test checklists, including tabulated checklists describing all manufacturing and delivery activities such as Inspection or Test, frequency of tests, description of tests, acceptance criteria of tests, such as verification, witnessing or holding tests and sign-off by the Quality Control Manager and the Departmental Representative, if the Departmental Representative witnesses the tests; and
  - .14 Forms used to ensure the application of the inspection and test checklist requirements. These forms shall be identified in the checklists and describe all testing requirements for Contract Document compliance.
- .4 The Contractor shall appoint a full time qualified and experienced Quality Control Manager, 100% of their time dedicated to quality matters and who will report regularly to the Contractor's management at a level that shall ensure that Quality Control requirements are not subordinated to manufacturing, construction or delivery. The Quality Control Manager shall be empowered by the Contractor to resolve quality matter and shall be onsite for the duration of the Contract.



- .5 The Quality Control Plan shall include samples of all forms to be filled in by the Quality Control Inspectors. All forms shall be signed by the Quality Control Manager and submitted promptly to the Departmental Representative who will add its review signature.
- .6 An independent check of all Work shall be performed by the Contractor. The Contractor shall appoint Quality Control Inspectors to ensure compliance of products and workmanship with Contract requirements. The same personnel may not be used to perform a given task and to check the quality and accuracy of the task.
- .7 At completion of the Work a bound and itemized copy of all Quality Control documents and reports shall be prepared by the Contractor's Quality Manager and submitted to the Departmental Representative.

## **1.6 INSPECTION**

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order any 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.
- .5 The Departmental Representative will provide the Contractor with an Approval to Proceed document, after performing an audit and confirming all requirements are met, as stated in Section 01 71 00 - Examination and Preparation. The Approval to Proceed must be signed by the Departmental Representative and the Contractor's representative before proceeding to the next layer.
  - .1 The Contractor shall provide a minimum of 48 hours notice to the Departmental Representative to arrange for an audit and Approval to Proceed.

## **1.7 INDEPENDENT INSPECTION AGENCIES**

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

## **1.8 ACCESS TO WORK**

- .1 Allow inspection / testing agencies access to Work, including but not limited to: off site manufacturing and fabrication plants, QC testing facilities and asphalt plants.
- .2 Co-operate to provide reasonable facilities for such access.

## **1.9 PROCEDURES**

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Provide labour and facilities to obtain and handle samples and materials on site.

## **1.10 NON-CONFORMANCES**

- .1 A Non-Conformance can relate to any item within the Contract including but not limited to: materials testing, lines and levels, products, design-build items, traffic accommodation, quality control, environmental, health and safety, and other general procedural matters including communication protocols.
- .2 Contractor's Internal Non-Conformance Report (NCR):
  - .1 Should the Contractor's QC reporting indicate that the Work is not in conformance, the Contractor's QC Manager shall issue an internal Non-Conformance Report (NCR) to the Contractor, with a copy to the Departmental Representative, including a response time.
- .3 The Contractor shall then respond to the QC Manager, with a copy to the Departmental Representative, with respect to the NCR, within the specified time, with proposed resolutions and corrective actions. The Contractor and/or the QC Manager shall consult with the Departmental Representative on the resolutions.
- .4 The Departmental Representative will accept or reject the proposed resolution and corrective action proposal.
- .5 Payment for the Work itself may be withheld until the NCR issue is resolved.
- .6 Owner Issued NCR:
  - .1 Should the Quality Assurance reporting indicate that the Work is not in conformance, the Departmental Representative will issue to the Contractor a NCR, including a response time.
  - .2 The Contractor shall then respond to that NCR, within the specified time, with proposed resolutions and corrective actions.
  - .3 The Departmental Representative will accept or reject the proposed resolution and corrective action proposal.
  - .4 Assurance testing and inspection will be performed to determine if the corrective action has provided an acceptable product. Acceptance and rejection will continue until the Departmental Representative determines that a quality product has been achieved.
  - .5 Payment for the Work itself may be withheld until the NCR issue is resolved.
- .7 The Completion Certificate will not be issued if there are any unresolved Non-Conformance Reports.
- .8 Appealing an NCR:

- .1 If the Contractor disputes the validity of a finding in an NCR, the Contractor may file an appeal with the Departmental Representative. The Departmental Representative and the Contractor Representative will use all reasonable efforts to refine the area of dispute and to resolve the determination of conformance with the Contract.
- .2 If the Departmental Representative and the Contractor Representative cannot come to a mutually agreeable resolution, the Work that is the subject of the Non-Conformance Report shall be re-evaluated by an independent third-party, selected by the Departmental Representative in consultation with the Contractor, at a test frequency equivalent to twice that specified in the Contract or to such other frequency as may be mutually agreed between the Departmental Representative and the Contractor.
- .3 If the appeal testing confirms the non-conformance determination, all appeal testing costs will be borne by the Contractor. If the appeal testing shows that the Work did in fact meet the requirements of the Contract, all appeal testing costs will be borne by the Owner.

#### **1.11 OPPORTUNITIES FOR IMPROVEMENT**

- .1 Should the QA review indicate that the Work is not in conformance, but the variance is deemed minor by the Departmental Representative, the Departmental Representative may issue an Opportunity for Improvement (OFI) report.
- .2 The Contractor is encouraged to review the findings and undertake such modifications to the QC Plan and the work procedures as necessary to address the issue.

#### **1.12 REJECTED WORK**

- .1 Remove defective Work, whether as a result of poor workmanship, use of defective products or damage and whether incorporated in Work or not. Replace or re-execute defective Work in accordance with Contract Documents, through the NCR process.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in the opinion of the Departmental Representative, it is not expedient to the greater benefit of the Project to remedy defective Work or Work not performed in accordance with Contract Documents, the Owner may deduct from the Contract Price the difference in value between the Work performed and that called for by Contract Documents, the amount of which shall be determined by Departmental Representative.

#### **1.13 REPORTS**

- .1 In accordance with Section 01 33 00 - Submittals Procedures.

#### **1.14 TESTS AND MIX DESIGNS**

- .1 Furnish test results and designs as may be requested.

#### **1.15 MILL TESTS**

- .1 Submit mill test certificates as required in the Contract Documents.

**Part 2 Products**

**2.1 NOT USED.**

**Part 3 Execution**

**3.1 NOT USED.**

**END OF SECTION**

## **01 52 00 CONSTRUCTION FACILITIES**

### **Part 1 General**

#### **1.1 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 All work of this section shall be incidental to Contract and will not be measured for payment.

#### **1.2 INSTALLATION AND REMOVAL**

- .1 Provide construction facilities to execute work expeditiously.
- .2 Remove from site all such work after use.

#### **1.3 SITE STORAGE / LOADING**

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

#### **1.4 CONSTRUCTION PARKING**

- .1 Provide and maintain adequate access and parking at the project site in areas approved by the Departmental Representative.
- .2 Build and maintain temporary roads and provide snow removal during period of Work.
- .3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

#### **1.5 SECURITY**

- .1 If required by the Contractor, provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays. For extended shut-downs, the Contractor shall provide the level of security as required to protect the Work. The Contractor is advised that some random acts of vandalism to equipment have occurred within the Park. Cost of security personnel is incidental to the Work and no additional payment will be made.
- .2 It is strongly advised that the Contractor consider the provision of security personnel.

#### **1.6 EQUIPMENT, TOOL AND MATERIALS STORAGE**

- .1 Provide and maintain, in a 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 a manner to cause least interference with work activities.

#### **1.7 SANITARY FACILITIES**

- .1 Provide sanitary facilities for work force in accordance with governing regulations, ordinances and the EPP.

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

## **1.8 CONSTRUCTION SIGNAGE**

- .1 To be in accordance with Section 01 35 31 - Special Procedures for Traffic Control.

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 NOT USED.**

**END OF SECTION**

## **01 56 00      TEMPORARY BARRIERS AND ENCLOSURES**

### **Part 1    General**

#### **1.1      MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.2      INSTALLATION AND REMOVAL**

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

#### **1.3      HOARDING**

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

#### **1.4      GUARDRAILS AND BARRICADES**

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

#### **1.5      WEATHER ENCLOSURES**

- .1      Not used.

#### **1.6      DUST TIGHT SCREENS**

- .1      Not used.

#### **1.7      ACCESS TO SITE**

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

#### **1.8      PUBLIC TRAFFIC FLOW**

- .1      Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public in accordance with Section 01 35 31 - Special Procedures for Traffic Control.

#### **1.9      PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

- .1      In accordance with Section 01 14 00 - Work Restrictions.



**Part 2 Products**

**2.1 NOT USED.**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

## **01 61 00 COMMON PRODUCT REQUIREMENTS**

### **Part 1 General**

#### **1.1 MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.2 REFERENCE STANDARDS**

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in the Contract Documents.
- .3 If there is question as to whether any product or system is 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.
- .5 Conform to latest date of issue of referenced standards in effect on date of submission of Tenders, except where specific date or issue is specifically noted.

#### **1.3 QUALITY**

- .1 In accordance with Section 01 45 00 - Quality Control.
- .2 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .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 any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in Contract Documents, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .7 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .8 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative whose decision is final.

#### **1.4 AVAILABILITY**

- .1 Immediately after signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any 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 the 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 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber and miscellaneous metals on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

#### **1.6 TRANSPORTATION**

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

#### **1.7 MANUFACTURER'S INSTRUCTIONS**

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

## **1.8 CO-ORDINATION**

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

## **1.9 CONCEALMENT**

- .1 The Departmental Representative will inspect all work prior to any concrete pours. The Contractor shall notify the Departmental Representative 24 hours before any pour for inspection.

## **1.10 REMEDIAL WORK**

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

## **1.11 FASTENINGS**

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings that cause spalling or cracking of material to which anchorage is made are not acceptable.

## **1.12 PROTECTION OF WORK IN PROGRESS**

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

## **Part 2 Products**

- .1 Materials shall be in accordance with AT - Standard Specifications for Highway Construction (latest edition), or as directed by the Departmental Representative.

## **Part 3 Execution**

- .1 Work shall be completed in accordance with AT - Standard Specifications for Highway Construction (latest edition), or as directed by the Departmental Representative.

**END OF SECTION**

## **01 71 00 EXAMINATION AND PREPARATION**

### **Part 1 General**

#### **1.1 REFERENCES**

- .1 Owner's identification of existing survey control points and property limits.

#### **1.2 MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.3 QUALIFICATIONS OF SURVEYOR**

- .1 Qualified surveyor, licensed to practise in Place of Work, acceptable to Departmental Representative.

#### **1.4 SURVEY REQUIREMENTS**

- .1 The Departmental Representative shall identify the location of all work sites.
- .2 The Contractor shall be responsible for all other survey and layout work identified in the Contract Documents and as required to complete the works including but not limited to:
  - .1 Establishing lines and levels, locate and layout, by instrumentation.
  - .2 Staking for grading, cut and fill.
  - .3 Staking for slopes and top of embankment, sub-base course, base course and centreline for paving.
  - .4 Establishing culverts, catch basin structures, invert elevations and locations.
  - .5 Incidental field adjustments, such as staking of embankments and culverts to match post-stripping ground lines and actual field drainage patterns.
  - .6 Layout for interim and final lane markings, including those for intersection treatments
  - .7 Re-establishing the start and finish of "No Passing Zones", Passing Lanes or at new limits as directed by the Departmental Representative
  - .8 Re-establishing Reference Survey Control Points that are in danger of being damaged or destroyed.
  - .9 Ensuring survey instruments are properly calibrated prior to commencing Works.
- .3 Survey Accuracy:
  - .1 All survey work shall be tied into the existing Control Monument Network with grid coordinates in UTM Zone 11 NAD 83. Departmental Representative will provide information on Control Points.
  - .2 All traverses will be closed and balanced. All level loops and traverses will be tied into the Control Monument Network.
  - .3 Secondary Control Points will be tied into and relative to Control Monument Network. Accuracy for Control Point surveys shall be to second order:
  - .4 Horizontal shall be less than  $r = 5(d+0.2)$  where "r" is in cm and "d" is in km
  - .5 Vertical shall be less than  $0.008 \times \sqrt{k}$  where k is distance in kilometres.

- .4 Staking accuracy shall be:
  - .1 In bush areas, all elevations shall be within 100 mm of correct elevation. In open ground, all elevations shall be within 50 mm of correct elevation.
  - .2 In bush areas, all horizontal locations shall be within 100 mm of Design. In open ground, all horizontal locations shall be within 50 mm of Design.
  - .3 On highway surface, all elevations shall be within 10 mm of correct elevation.
  - .4 All structures shall be within 20 mm of Design elevation and horizontal
- .5 The Departmental Representative will complete quality assurance construction survey measurements to verify grades and alignment, interim survey re-measurements for excavation limits and final neat line measurements to verify payment quantities for completed works.
- .6 Contractor to provide cut sheet reports for all layers of road template to demonstrate that the defined construction tolerances have been achieved before advancing to the next stage. Departmental Representative to verify that they are correct by performing an audit.
  - .1 Shots are to be taken at 10m intervals along centreline, mid-points and shoulders.
  - .2 The Departmental Representative will provide the Contractor with an Approval to Proceed document in accordance with Section 01 45 00 - Quality Control.

## **1.5 RECORDS**

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Record locations of maintained, re-routed and abandoned service lines.

## **1.6 SUBMITTALS**

- .1 In accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit name and address of Surveyor to Departmental Representative.
- .3 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.
- .4 On request of Departmental Representative, submit survey data.
- .5 Submit certificate signed by surveyor certifying those elevations and locations of completed Work that conform to the Contract Documents.

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 CROSS SECTIONS**

- .1 Cross sections will be taken at a maximum of 20 metre intervals. Additional cross sections will be taken where variations occur, including but not limited to: drainage channels, structures and/or other obstructions.
  - .1 Cross section intervals will be established on OG and are to be used for the duration of the project.

### 3.2 LAYOUT REQUIREMENTS

<b>Survey Layout</b>	<b>Maximum Interval</b>	<b>Product</b>	<b>Tolerances</b>
Right-of-way	At each point of deflection and at sufficient points between as to be continuously visible.	Stake showing station and offset, or flagging.	Sufficient accuracy to prohibit encroachment into adjoining properties.
Clearing and Grubbing	Same as Right-of-way.	Same as Right-of-way.	Sufficient accuracy to prohibit encroachment into adjoining properties.
Grading – Slope Stakes	10 m in rock cuts; 20 m in all other cases. (100 m for machine-controlled grading)	One slope stake each side, at top of cut or bottom of fill, showing station, offset, vertical dimension to subgrade, and slope, plus cut/fill transition stake. Non-standard ditches will be staked separately. An additional slope stake, where applicable, at the top of a rock cut after the removal of overburden.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m  Vertical accuracy 25mm
Grading – Subgrade	20 m. (100 m for machine-controlled grading)	One stake at each side of the subgrade, showing station, offset and grade at the stake location, one at each break point, and one at centreline.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m  Vertical accuracy per Specifications
Top of Sub-base	20 m. (100 m for machine-controlled grading)	One stake at each side of the sub-base course, showing station, offset and grade at the stake location, one at each break point, and one at centreline.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m  Vertical accuracy per Specifications
Each Base Course	20 m. (100 m for machine-controlled grading)	One stake at each side of the base course, showing station, offset and grade at the stake location, one at each break point, and one at centreline.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m  Vertical accuracy per Specifications
Final Base Course only	20 m. (100 m for machine-controlled grading)	One stake at each side of the base course, showing station, offset and grade at the stake location, one at each break point, and one at centreline.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m  Vertical accuracy per Specifications
Culverts	Inlet and outlet.	One stake at each end of the culvert, plus an offset line, showing invert elevation and station.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m  Vertical tolerance 0.020m



Storm Drainage, Subdrain, Watermain or Sanitary Sewer		Stakes showing locations of manholes, catch basins and other structures, and invert locations of pipe inlets and outlets, as well as stations.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m  Vertical tolerance 0.020m
Retaining Walls	Not more than 10 m, and at alignment changes.	One stake showing control line location and either the elevation at the top of the wall or the elevation at the bottom of footing excavation, as well as station.	Per Specifications
Paving	20 m	Stake showing station and offset, reference points (eg. centerline offset, barrier, changes in paint lines etc.)	N/A
Level Course / Profile Paving	5 m grid pattern	5 m grid on pavement break points with cuts / fills.	N/A
Profile Milling	5 m grid pattern	5m grid on pavement break points with cuts / fills.	N/A
Superelevation change	At percentage change points	Stakes showing station and superelevation percentage.	N/A
Concrete Barriers	Same as paving.	Same as paving.	Offset from CL accuracy required +/- 0.030m
Signs		Stake at each sign location with stationing and sign designation.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m
Curb and Gutter	10 m and at alignment changes. Curb returns: 5 m or at quarter points, whichever is less.	Offset hub and nail with cut/fill to gutter grade, show stationing.	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m  Vertical tolerance +/- 0.010m
Median/Island Curb	Continuous.	Paint line at face/edge of curb	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m
Pavement Marking	10 m, changes in line type, symbols	Paint dots and lines	+/- 0.30m – up or down chainage  Offset from CL accuracy required +/- 0.030m

- .1 This table shows layout details for general situations; particular circumstances may require more or less staking.
- .2 The right-of-way limit will be laid out only where there is the work, including utility relocation, to be performed within three metres of it.

### 3.3 MACHINE-CONTROLLED GRADING

- .1 Machine controlled grading may be used as a substitute for conventional grade staking under the following conditions:

- .1 The equipment utilized shall be capable of meeting the Design vertical and horizontal tolerances and the use of machine-controlled equipment will in now way relieve the Contractor of the requirement to meet the specified tolerances.
  - .2 The Departmental Representative may require the Contractor to revert to conventional staking methods at any point during construction if the machine-controlled grading is producing unacceptable Work and the cost of doing so will be borne by the Contractor.
  - .3 The Departmental Representative may provide the Contractor the available electronic files of Design information without warrant with respect to the suitability for the purposes intended by the Contractor and the cost of making them suitable shall be borne by the Contractor. The Contractor remains responsible for completing the works as described in the Contract Documents, even in the event that the electronic Design information provided is not consistent with the Contract Documents.
- .2 As a minimum the Contractor shall provide an orientation stake every 100 metres showing station, offset and grade.

**END OF SECTION**

## **01 74 11      CLEANING**

### **Part 1    General**

#### **1.1      MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.2      PROJECT CLEANLINESS**

- .1      Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2      Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative and in accordance with Section 01 35 43 - Environmental Procedures. Do not burn waste materials on site.
- .3      Clear snow and ice in accordance with Section 01 35 31 – Special Procedures for Traffic Control.
- .4      Keep roadway clean in accordance with Section 01 35 31 – Special Procedures for Traffic Control.
- .5      Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6      One bear proof container will be provided by Parks Canada. Contractor to provide any additional on-site bear proof containers they require for collection of waste materials and debris.
- .7      Remove waste material and debris from site at end of each working day.
- .8      Dispose of waste materials and debris off site in accordance with Section 01 35 43 - Environmental Procedures.
- .9      Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .10     Provide adequate ventilation during use of volatile or noxious substances.
- .11     Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12     The Departmental Representative and Environmental Surveillance Officer may, at their total discretion, require the Contractor to suspend work activities until such a time as the Work Site is cleaned and debris, waste, and animal attractants are satisfactorily managed. The Contractor shall do as requested at their cost and no claim for time or additional costs will be accepted.

#### **1.3      FINAL CLEANING**

- .1      When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2      Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .3      Remove waste products and debris including that caused by Owner or other Contractors.

- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Inspect finishes and ensure specified workmanship and operation.
- .7 Remove dirt and other disfiguration from exterior surfaces.
- .8 Sweep and wash clean paved areas.
- .9 Remove all construction debris and accumulated dirt from completed drainage systems; manholes; catch basins; and all piping.

**Part 2 Products**

**2.1 NOT USED.**

**Part 3 Execution**

**3.1 NOT USED.**

**END OF SECTION**

## **01 77 00 CLOSEOUT PROCEDURES**

### **Part 1 General**

#### **1.1 MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.2 INSPECTION AND DECLARATION**

- .1 Contractor's Inspection: Contractor and all subcontractors shall conduct an 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 shall correct Work accordingly.
- .3 Completion: 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 re-inspection.

### **Part 2 Products**

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

### **Part 3 Execution**

#### **3.1 NOT USED.**

**END OF SECTION**

## **01 78 00 CLOSEOUT SUBMITTALS**

### **Part 1 General**

#### **1.1 MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.2 CLOSEOUT SUBMITTALS**

- .1 The Contractor shall provide the following documents and information to the Departmental Representative prior to them being eligible for Final Completion as detailed in Section 01 77 00 – Closeout Procedures.

#### **1.3 AS-BUILTS AND SAMPLES**

- .1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to the 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.
- .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.

#### **1.4 RECORDING ACTUAL SITE CONDITIONS**

- .1 Record information on set of black line opaque Drawings and in copy of the Project Manual.
- .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
  - .1 Field changes of dimension and detail.
  - .2 Changes made by change orders.

- .3 Details not on original Contract Drawings.
- .4 References to related shop drawings and modifications.
- .4 Specifications: legibly mark each item to record actual construction, including:
  - .1 Changes made by Addenda and change orders.

## **1.5 FINAL SURVEY**

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

## **1.6 WARRANTIES AND BONDS**

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principals.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.
- .6 Co-execute submittals when required.
- .7 Retain warranties and bonds until time specified for submittal.

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 NOT USED.**

**END OF SECTION**



## 02 41 13 ASPHALT PAVEMENT REMOVAL

### Part 1 General

#### 1.1 DESCRIPTION

- .1 Removal of existing asphalt pavement to depths and extents shown in the Contract Documents and as accepted by the Departmental Representative.

#### 1.2 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Measure for payment for Milling will be the square metres of asphalt pavement of existing roadway actually removed and stockpiled in accordance with the Contract Document or as directed by the Departmental Representative.
  - .1 Payment for milling shall be made under **“Unit Price Item 1a - Asphalt Pavement Removal – Partial Depth Milling”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .2 Payment per square metre of asphalt removal, whether partial or full depth, will remain the same, regardless of the number of passes required to complete the Work, to the depth and extents specified, as per the Contract Documents.
- .3 Items considered incidental to the Work include, but are not limited to:
  - .1 All operations involved in milling and pulverizing including but not limited to:
    - .1 Survey, cold milling or excavating, sweeping, loading, hauling, stockpiling and/or disposal and cleaning of remaining pavement surface
  - .2 Overhaul.
  - .3 Asphalt Concrete Pavement placing and subsequent removal at milled tie-in locations.
  - .4 Cleaning of existing pavement shoulder, whether via sweeping or other methods.
  - .5 Maintaining milled areas, including drainage, until completion of asphalt paving.
  - .6 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
- .4 Traffic Control required for this Work shall be incidental to **“Lump Sum Price Item 2 - Traffic Accommodation”** and no separate payment will be made to the Contractor.
- .5 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”** and no additional payment will be made for remobilization of equipment if all milling work cannot be completed at once.

#### 1.3 QUALITY CONTROL

- .1 In accordance with Section 01 45 00 - Quality Control.

#### 1.4 SUBMITTALS

- .1 In accordance with Section 01 33 00 Submittal Procedures.

## **1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 In accordance with Section 01 35 43 - Environmental Procedures.

## **1.6 DEFINITIONS**

- .1 Profile Milling: Removal of asphalt concrete pavement to an accurate depth of cut, profile and cross slope and shall include loading the milled material directly into trucks.
- .2 Partial Depth Milling: Removal of asphalt concrete pavement, other than Profile Milling.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 The Contractor is to ensure that the maximum particle size of milled materials is less than 50 mm and shall sieve or otherwise separate/remove larger particles at their cost.

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Prior to beginning removal operation, the Contractor shall inspect and verify with the Departmental Representative, all areas, depths and lines of asphalt pavement to be removed.
- .2 Placement of gravels to level the running surface for the milling machine, if required, will be considered incidental to the Work and no additional payment will be made.
- .3 Have appropriate Traffic Control measures in accordance with Section 01 35 31 - Special Procedures for Traffic Control.

### **3.2 PROTECTION**

- .1 Protect existing pavement not designated for removal, concrete deck, concrete curb and barriers, light units and structures from damage. In event of damage, the Contractor shall immediately replace or make repairs to the satisfaction of the Departmental Representative at no additional cost.

### **3.3 REMOVAL**

- .1 Use cold milling, planning or grinding self-powered equipment with automatic grade controls capable of operating from string line, and capable of removing part of pavement surface to depths or grades indicated.
- .2 For Full Depth Asphalt Removal, it is anticipated that the depth of the existing pavement is 150 – 400mm deep. Existing asphalt pavement thickness is not uniform and will vary from one location to the next.
- .3 Full depth asphalt pavement removal shall be done to the lines shown on the IFC Drawings or as designated by the Departmental Representative.
- .4 Partial Depth Asphalt Pavement Removal by milling to lines and grades shown on the IFC Drawings or as established by Departmental Representative in field:
  - .1 Use self-powered equipment and methods of removal and hauling which do not damage or disturb underlying roadway structure.

- .5 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.
  - .1 Provide for suppression of dust generated by removal process to ensure a dust free Work Site.
- .6 To tie in from existing pavement to new overlay, remove existing asphalt pavement by milling to lines and grades established by Departmental Representative in field or as per the Contract Documents.
- .7 If applicable, at mill and fill locations, remove existing asphalt to the depths, lengths and width specified in the Contract Documents and as established by Departmental Representative in field.
- .8 If the base course is disturbed by milling operations the Contractor will be required to rectify the base course, to the acceptance of the Departmental Representative, at the Contractor's cost.
- .9 In low areas where water may pond, the Contractor shall cut drainage channels through the shoulders to prevent water from collecting in the milled areas, prior to opening the lane(s) to traffic, as directed by the Departmental Representative.
- .10 The maximum delay between the area cold milled and the completion of asphalt paving of the same area will be seven (7) days. The Contractor shall be responsible for maintaining the milled surface for the travelling public as directed by the Departmental Representative.

### **3.4 STOCKPILING OF MATERIAL**

- .1 The Contractor shall place removed asphalt material outside of the National Park or at other locations designated by the Departmental Representative.
- .2 Removed asphalt material shall remain the property of the contractor
- .3 The material shall be stockpiled by a loader and in such a manner as to prevent consolidation which means exercising caution and minimizing running equipment on the stockpiles. Trucks and trailers shall not drive on the pile.
- .4 The height of the pile shall not exceed the height of the loader bucket.
- .5 The Contractor shall be responsible to remove any contamination of the stockpile millings.

### **3.5 FINISH TOLERANCES**

- .1 Finished surfaces in areas where asphalt pavement has been removed shall be within +/-5 mm of the grade specified and shall not be uniformly high or low.

### **3.6 SWEEPING**

- .1 Sweeping shall be done using the same lane closures as the milling operation and all loose material must be removed prior to opening the lane(s) to traffic.
- .2 Sweep remaining asphalt pavement surfaces clean of debris resulting from removal operations using rotary power brooms and hand work and brooming as required. No extra payment will be made for sweeping or associated hand work.

### **END OF SECTION**

## **02 81 01      HAZARDOUS MATERIAL**

### **Part 1    General**

#### **1.1      REFERENCES**

- .1      Export and Import of Hazardous Waste Regulations (EIHW Regulations), SOR/92-637.
- .2      National Fire Code of Canada 1995.
- .3      Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34).
- .4      Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

#### **1.2      MEASUREMENT AND PAYMENT PROCEDURES**

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

#### **1.3      DEFINITIONS**

- .1      Dangerous Goods: Product, substance, or organism that is specifically listed or meets the hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2      Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3      Hazardous Waste: Any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- .4      Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by a combination of federal and provincial laws.

#### **1.4      SUBMITTALS**

- .1      In accordance with Section 01 33 00 - Submittal Procedures.
- .2      Retain current Material Safety Data Sheet (MSDS) for each hazardous material required on site. Submit MSDS to Departmental Representative upon request.

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

- .1      Coordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
- .2      Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
- .3      Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.
- .4      All explosives must be mixed outside of the Park and delivered to the site. No storage of explosives shall be allowed within the National Parks.

- .5 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.
- .6 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
  - .1 Store hazardous materials and wastes in closed and sealed containers which are in good condition.
  - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
  - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
  - .4 Segregate incompatible materials and wastes.
  - .5 Ensure that different hazardous materials or hazardous wastes are not mixed.
  - .6 Store hazardous materials and wastes in a secure storage area with controlled access.
  - .7 Maintain a clear egress from storage area.
  - .8 Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.
  - .9 Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.
  - .10 Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .7 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .8 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

## 1.6 TRANSPORTATION

- .1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
- .2 If exporting hazardous waste to another country, ensure compliance with federal Export and Import of Hazardous Waste Regulations.
- .3 If hazardous waste is generated on site:
  - .1 Coordinate transportation and disposal with Departmental Representative.
  - .2 Ensure compliance with applicable provincial laws and regulations for generators of hazardous waste.
  - .3 Use only a licensed carrier authorized by provincial authorities to accept subject material.
  - .4 Prior to shipping material, obtain written notice from intended hazardous waste treatment or disposal facility that it will accept material and that it is licensed to accept the material.
  - .5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
  - .6 Ensure that only trained personnel handle, offer for transport, or transport dangerous goods.

- .7 Provide a photocopy of all shipping documents and waste manifests to Departmental Representative.
- .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to Departmental Representative.
- .9 Report any discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Only bring on site the quantity of hazardous materials required to perform Work.
- .2 Maintain MSDSs in proximity to where the materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

## **Part 3 Execution**

### **3.1 WASTE MANAGEMENT AND DISPOSAL**

- .1 In accordance with Section 01 35 43 - Environmental Procedures.
- .2 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
- .3 Recycle hazardous wastes for which there is an approved, cost effective recycling process available.
- .4 Send hazardous wastes only to authorized hazardous waste disposal or treatment facilities.
- .5 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
- .6 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

**END OF SECTION**

## 10 14 53      **TRAFFIC SIGNAGE**

### **Part 1    General**

#### **1.1      DESCRIPTION**

- .1    Removal and disposal, supply and installation and relocation of permanent regulatory and custom traffic signs as required to complete the Work as specified in the Contract Documents and as directed by the Departmental Representative.

#### **1.2      REFERENCES**

- .1    Parks Canada Exterior Signage Standards and Guidelines (latest edition)
- .2    ASTM A276, Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
- .3    ASTM B209M, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .4    ASTM B210M, Specification for Aluminum-Alloy Drawn Seamless Tubes.
- .5    ASTM B211M, Specification for Aluminum and Aluminum-Alloy Bar, Rods and Wire.
- .6    CAN/CSA-G40.21 Structural Quality Steels.
- .7    CAN/CSA-G16-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .8    CAN/CSA-O80 Series, Wood Preservation.
- .9    CSA O121M, Douglas Fir Plywood.
- .10    CSA W47.2, Certification of Companies for Fusion Welding of Aluminum.
- .11    CGSB1-GP-12c-65, Standard Paint Colours:
- .12    CAN/CGSB-1.28, Alkyd, Exterior House Paint.
- .13    CAN/CGSB-1.59, Alkyd, Exterior Gloss Enamel.
- .14    CAN/CGSB-1.94-M89, Xylene Thinner (Xylol).
- .15    CAN/CGSB-1.99-92, Exterior and Marine Phenolic Resin Varnish.
- .16    CAN/CGSB-1.104-M91, Semigloss Alkyd Air Drying and Baking Enamel.
- .17    CAN/CGSB-1.132-M90, Zinc Chromate Primer, Low Moisture Sensitivity.
- .18    CGSB 1-GP-189M-78, Primer, Alkyd, Wood, Exterior.
- .19    CGSB 31-GP-3M-88, Corrosion Preventive Compound, Cold Application, Soft Film.
- .20    CGSB 62-GP-9M-80, Prefabricated Markings, Positionable, Exterior, for Aircraft Ground Equipment and Facilities.
- .21    CGSB 62-GP-11M-78, Marking Material, Retroreflective, Enclosed Lens, Adhesive Backing.
- .22    AT - Standard Specifications for Highway Construction (latest edition).

#### **1.3      MEASUREMENT AND PAYMENT PROCEDURES**

- .1    Measure for payment for supply and installation of posts, hangers and bases will be based on each complete unit installed in accordance with the Contract Documents and accepted by the Departmental Representative.
  - .1    Payment will be made under “**Unit Price Item 2a – Traffic Signage – Supply and Install Steel Posts, Hangers and Bases**” and the price(s) bid shall be full



compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.

- .2 Items considered incidental to the Work include, but are not limited to:
  - .1 Removal and disposal of existing signs, bases and posts being replaced.
  - .2 Filling holes as required for removal of existing sign bases.
  - .3 Survey and layout.
  - .4 Hot-dipped galvanizing of all metal posts, hangers and miscellaneous hardware.
  - .5 Hot-dipped galvanized sign shims supply and installation.
  - .6 Temporary stockpiling and retrieval of signs.
  - .7 Bilingual signage requirements as detailed in the Contract Documents.
  - .8 Locating utilities in prior to commencing the Works.
  - .9 Landscaping around sign bases.
  - .10 Disposal of damaged items as directed by the Departmental Representative.
  - .11 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
- .3 Traffic Control required for this Work shall be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”** and no separate payment will be made to the Contractor.
- .4 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”**, and no additional payment will be made.

#### 1.4 SUBMITTALS

- .1 In accordance with Section 01 33 00 Submittal Procedures.

#### 1.5 QUALITY CONTROL

- .1 In accordance with Section 01 45 00 - Quality Control.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.

#### 1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 In accordance with Section 01 35 43 - Environmental Procedures.

### Part 2 Products

#### 2.1 MATERIALS

- .1 The Contractor is responsible for supplying all materials associated with the installation of signage.
- .2 Traffic signs shall be supplied and installed in accordance with AT - Standard Specifications for Highway Construction (latest edition) unless specified otherwise in the Contract Documents.

- .3 Signs posts, bases and hangers sizing and other requirements to be in accordance with the Contract Documents.
- .4 Sign hangers to be properly sized for the sign face area in accordance with the Contract Documents.
- .5 All custom signs to be accepted by the Departmental Representative prior to ordering.
- .6 All signs (permanent and temporary) shall be in both English and French. Translations to be accepted by the Departmental Representative prior to ordering.

### **Part 3 Execution**

#### **3.1 INSTALLATION**

- .1 In accordance with AT - Standard Specifications for Highway Construction (latest edition).
- .2 Load, haul and install supplied single post and aluminum signs and bases in the following manner:
  - .1 Locating power / telephone / gas lines / services / utilities at all proposed sign locations.
  - .2 Perform layout and verify measurements to ensure signs are installed as per the Contract Documents.
  - .3 Concrete bases: Excavate one hole for the concrete base at the location and depth as per the Contract Documents. Using some of the excavated material, level and compact bottom of hole. Place base with one side parallel to the edge of asphalt and level.
  - .4 The top of the base is to be flush or 50mm above finished grade.
  - .5 Adjust the post height, as required, by using a pipe cutter or cut off saw in accordance with AT - Standard Specifications for Highway Construction (latest edition). The Contractor will measure existing elevations at each site and calculate the cuts needed.
  - .6 Bases must be perfectly plumbed. Vertical and horizontal tolerances for the base are 0.075m. Tolerance for the plumb of the posts is 0.01 m per 1.0 m or 1/4" on a two foot carpenters level. Tolerances for the signs are 0.075 m for distance from asphalt and 0.075 m for height above white line.
  - .7 The Contractor is responsible for hauling all materials to and from each work site.
  - .8 Landscape so the top of the base is flush or 50 mm above finished grade.
  - .9 Remove all excess material from site, including boulders larger than 100 mm.
  - .10 All signs are to be covered until the Departmental Representative advises to uncover.

**END OF SECTION**

## **31 05 10 CORRECTED DRY DENSITY FOR FILL**

### **Part 1 General**

#### **1.1 DESCRIPTION**

- .1 This Section defines correction to maximum dry density to take into account aggregate particles larger than 19mm.

#### **1.2 REFERENCES**

- .1 ASTM C127, Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate.
- .2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
- .3 ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
- .4 ASTM D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

#### **1.3 DEFINITIONS**

- .1 Corrected maximum dry density is defined as:
  - .1  $D = (D1 \times D2) / ((F1 \times D2) + (F2 \times D1))$ .
  - .2  $D = (F1 \times D1) + (0.9 \times D2 \times F2)$ .
  - .3 Where: D = corrected maximum dry density kg/m<sup>3</sup>.
  - .4 F1 = fraction (decimal) of total field sample passing 19mm sieve.
  - .5 F2 = fraction (decimal) of total field sample retained on 19mm sieve (equal to 1.00 - F1).
  - .6 D1 = maximum dry density, kg/m<sup>3</sup> of material passing 19mm sieve determined in accordance with Method A of ASTM D1557.
  - .7 D2 = bulk density, kg/m<sup>3</sup>, of material retained on 19mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127.
- .1 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253 wet method when directed by Departmental Representative.

### **Part 2 Products**

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

### **Part 3 Execution**

#### **3.1 NOT USED.**

**END OF SECTION**

## 31 11 00 CLEARING AND GRUBBING

### Part 1 General

#### 1.1 DESCRIPTION

- .1 Clearing and Grubbing and disposing of woody debris as required to complete the Work as specified in the Contract Documents and as directed by the Departmental Representative.

#### 1.2 REFERENCES

- .1 AT - Standard Specifications for Highway Construction (latest edition).

#### 1.3 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Measure for payment for clearing will be the area in horizontal (2D) hectares of clearing that has been acceptably completed in accordance with the Contract Documents and will, unless otherwise specified, be measured from the edge of the existing pavement to 3m past the cut fill line as shown approximately on the IFC Drawings or as directed by the Departmental Representative.
  - .1 Payment will be made under “**Unit Price Item 3a – Clearing and Grubbing - Clearing**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents
- .2 Measure for payment for grubbing will be the areas in horizontal (2D) hectares of grubbing that has been acceptably completed in accordance with the Contract Documents and will, unless otherwise specified, be measured from the edge of the existing pavement to 1m past the cut fill line as shown approximately on the IFC Drawings or as directed by the Departmental Representative.
  - .1 Payment will be made under “**Unit Price Item 3b – Clearing and Grubbing - Grubbing**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .3 Items considered incidental to the Work include, but are not limited to:
  - .1 Loading, hauling and disposal of clearing and grubbing waste.
  - .2 Overhaul.
  - .3 Bird surveys must be completed and current for all Works on previously felled timber and grubbing areas in accordance with Section 01 35 43 - Environmental Procedures, when Work is to occur outside of the least risk window. Bird surveys must be completed by a Registered Professional Biologist.
  - .4 Removal and disposal of previously felled timber.
  - .5 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
- .4 If the Contractor is requested to arrange for sale of merchantable timber. Any cost / credit for the sale of merchantable timber will be paid under “**Lump Sum Price Item 3 – Prime Cost Sum**”.

- .5 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”**, and no additional payment will be made.
- .6 Traffic Control required for this Work shall be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”** and no separate payment will be made to the Contractor.

#### 1.4 DEFINITIONS

- .1 Flush cutting consists of cutting trees, stumps or vegetative growth to within 100 mm of the ground, leaving the root structure undisturbed and disposing of felled trees, previously uprooted trees, stumps and clearing wood debris as specified.
- .2 Clearing consists of cutting trees and brush vegetative growth to within 300 mm of the ground and disposing of felled trees, previously uprooted trees, stumps, and clearing wood debris as specified.
- .3 Grubbing consists of excavation and disposal of stumps, roots and wood debris to a depth of 0.6m below the ground line.
- .4 Chipping consists of chipping wood debris, except merchantable timber, into wood chips. Finished wood chip material shall be able to pass through a 100 mm by 100 mm screen.
- .5 Merchantable timber is all timber with butt diameter in excess of 150 mm and top down to 100 mm.

#### 1.5 QUALITY CONTROL

- .1 In accordance with Section 01 45 00 – Quality Control.

#### 1.6 SUBMITTALS

- .1 In accordance with Section 01 33 00 Submittal Procedures.

#### 1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 In accordance with Section 01 35 43 - Environmental Procedures.

#### 1.8 PROTECTION

- .1 Prevent damage to trees, natural features, bench marks, existing pavement, water courses and root systems of trees that are to remain.
  - .1 No grubbing to be completed with 1m of the tree drip line.
- .2 Repair any damaged items to approval of Departmental Representative.
- .3 Replace any trees designated to remain, if damaged, as directed by Departmental Representative.
- .4 Contractor shall take all measures to ensure that trees do not fall into streams, rivers, wetlands or water bodies or outside the clearing limits as marked by colored flagging. Work within a 30 metre buffer of watercourses, water bodies or wetlands to be in accordance with Section 01 35 43 – Environmental Procedures.
- .5 Trees inadvertently felled into streams, rivers, watercourses or outside the clearing limits shall be removed by means (e.g. winch) so as not to damage the substrate or any standing trees left outside the clearing limits. Machinery shall not go outside the clearing limits, or into streams, rivers, watercourses or water bodies to remove felled trees.

- .6 Logs and other salvage materials are to be conveyed to and placed at the storage site without spread of debris or damage to other standing trees or landscape resources outside the marked clearing or storage limits. They shall not be skidded through wetlands, waterways or water bodies.
- .7 During the grubbing component, stumps, roots, imbedded logs and other non-soil debris shall be pulled and shaken free of loose soil and rocks before transport.
- .8 No slash clearing, pickup or grubbing shall occur outside of the designated area or within 1 metre of the drip line of existing forest.
- .9 Existing areas of vegetation disturbed as a result of this Contract shall be rehabilitated using approved topsoil from the Park and a native grass seed mix as specified in Section 32 92 22 – Hydraulic Seeding.

## **Part 2 Products**

### **2.1 NOT USED.**

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Inspect site and verify with Departmental Representative, items designated to remain.
- .2 The extent of grubbing shall be as indicated in the Contract Documents and the Contractor shall not commence work on this activity until approval to proceed has been granted by the Departmental Representative.

### **3.2 CLEARING**

- .1 Clear as directed by Departmental Representative by cutting trees and vegetative growth.
- .2 Cut off branches and cut down trees overhanging area cleared as directed by Departmental Representative.
- .3 Cut off unsound branches on trees designated to remain as directed by Departmental Representative.
- .4 All clearing shall be felled in such a manner that surrounding vegetation is preserved along the construction limits. Stumps remaining within 3.0 metres of cleared perimeter are to be cut flush with ground and vegetative mat left undisturbed.

### **3.3 GRUBBING**

- .1 Grub out stumps and wood debris including roots and embedded logs up to a depth of 0.6m below the ground surface.
- .2 Grubbing ripper teeth depth shall be kept as shallow as possible to minimize contamination of topsoil with subsoils. This may require individual ripping of stumps in some locations. In addition, while removing stumps, roots or embedded logs, the Contractor shall shake them on site to remove as much soil as possible.

### **3.4 REMOVAL AND DISPOSAL**

- .1 All cleared and grubbed wood and vegetative materials, excluding merchantable timber, shall be loaded, hauled and disposed of outside of the National Park at a disposal site as agreed with the Departmental Representative at the Contractor's expense.
- .2 Merchantable timber shall remain property of PCA and should be cut at the base to the maximum suitable length.
- .3 Non-Merchantable Timber shall be processed, cut, loaded and hauled according to Provincial highway regulations at the Contractor's expense.
- .4 Stockpiled non-merchantable timber will be retained by the Crown and any requirement to process full-length log decks into firewood length will be the responsibility of the Crown.
- .5 Burning of woody Debris is not approved, the Contractor must haul the debris outside of the Parks and dispose of at their cost.
- .6 Contractor is responsible for ensuring weights and dimensions of all haul vehicles meet all applicable regulations.

### **3.5 FINISHED SURFACE**

- .1 In areas of grubbing, leave ground surface in condition suitable for stripping of topsoil to approval of Departmental Representative.
- .2 In areas of flush cutting, leave stumps cut flush with ground elevation and root structure undisturbed.
- .3 Finished surface requirements:
  - .1 Refer to Best Management Practices "Vegetation Removal Mitigations Module".
  - .2 In areas of flush cutting, leave stumps cut flush with ground elevation and root structure undisturbed unless otherwise directed by the Departmental Representative.
  - .3 Where possible, vegetative debris should not be left to accumulate on site and must either be burned or chipped.
  - .4 Chips cannot exceed two inches in depth to a maximum coverage of 5% ground cover.
  - .5 Where accessible, all stems suitable for firewood should be removed from site, hauled and stockpiled at a location designated by the Departmental Representative.
  - .6 At inaccessible sites or for trees with little firewood value, no more than 50 stems per linear kilometer may be left on site. A stem is defined as any tree with a diameter at breast height (DBH) greater than 15 centimeters.
  - .7 All retained stems must be limbed and lie flush to the ground.
  - .8 Accumulation of fine wood y fuels is of greatest concern from both a fire management and vegetation re-growth perspective. Fine fuel accumulation cannot exceed 10% ground cover and must be less than 10 centimeters in depth. Fine woody fuels have a diameter less than 3 centimeters.
  - .9 Medium fuels may accumulate to a maximum of 20% ground cover and shall not exceed 20 centimeters in depth. Medium fuels have a diameter ranging from 3 centimeters to 7 centimeters



- .10 Mechanical distributed areas and burn piles must be seeded with an approved native grass seed mix within 6 months of project completion.
- .11 Ground disturbance must be kept to a minimum. Off-highway mechanical equipment must have tire pressure of 7 psi or lower.

**END OF SECTION**

## 31 24 13 ROADWAY AND DRAINAGE EXCAVATION

### Part 1 General

#### 1.1 DESCRIPTION

- .1 This item consists of the excavation and use/disposal of all materials in conformity with the lines, grades and dimension indicated in the Contract Documents and as directed by the Departmental Representative and includes:
  - .1 Stripping of organic material.
  - .2 Roadway, culvert and borrow excavation.
  - .3 Construction of roadway ditches, embankments, permanent access and connecting roads, approaches, entrances, day use areas, berms, approved haul roads and other earthworks necessary for the construction of the road.
  - .4 Removal and disposal of waste/unsuitable / surplus materials from excavation, embankment and borrow areas.
  - .5 Transportation of excavated materials.
  - .6 Finishing of top surfaces and slopes.
  - .7 Maintenance of the work set forth under this section in a finished condition until any portion thereof has been accepted as completed by the Departmental Representative.

#### 1.2 REFERENCES

- .2 AT - Standard Specifications for Highway Construction (latest edition).
- .3 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,000 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).

#### 1.3 MEASUREMENT AND PAYMENT PROCEDURES

- .1 **Stripping and Waste Excavation:**
  - .1 Measure for payment for Stripping will be the volume in cubic metres measured in its original position from cross section taken by the Departmental Representative in areas of excavation. Work is to be done in accordance with the Contract Documents and accepted by the Departmental Representative.
  - .2 Payment will be made under “**Unit Price Item 4a – Roadway and Drainage Excavation – Stripping for Disposal & Waste Excavation**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .2 **Roadway and Drainage Excavation:**
  - .1 Measure for payment for Common Excavation will be the volume in cubic metres measured in its original position from cross sections taken by Departmental Representative in areas of excavation. Work is to be done in accordance with the Contract Documents and accepted by the Departmental Representative.

- .1 Payment will be made under **“Unit Price Item 4b - Roadway and Drainage Excavation - Common Excavation”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .2 Written Approval to Proceed must be completed by the Departmental Representative prior to sub-excavation for the removal of unsuitable material(s). Sub-excavation for the removal of unsuitable material(s) to be paid under **“Unit Price Item 4a – Roadway and Drainage Excavation - Stripping”**.
- .3 The Contractor shall take care not to contaminate suitable surplus materials with Waste materials Waste materials shall be stockpiled separately by type at locations identified in the Contract Documents.
- .3 Departmental Representative will take initial cross sections upon completion of grubbing and again upon completion of stripping and immediately prior to excavation of material to be incorporated into work.
- .4 Items considered incidental to the Work include, but are not limited to:
  - .1 General:
    - .1 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
    - .2 Survey and layout.
    - .3 Excavating, loading, hauling, placing and compacting material within the limits of the Works.
    - .4 Separating of organic material from non-organic material and stockpiling, as directed by the Departmental Representative.
    - .5 Loading hauling, placing and compaction of boulders less than 2.0 cubic metres into large embankments.
    - .6 Scarifying or benching existing slopes or existing road surfaces.
    - .7 Overhaul.
    - .8 Embankment construction.
    - .9 Watering, drying or compacting soils to achieve specified densities inclusive of all compaction efforts.
    - .10 Proof rolling.
    - .11 Compaction of material (150 mm) below subgrade horizon in areas of cut.
    - .12 Placing material in stockpiles, grading, or maintaining the stockpile site.
    - .13 Finishing.
  - .2 Stripping:
    - .1 Loading, hauling and stockpiling stripping material as described in this section or other location(s) as directed by the Departmental Representative.
  - .3 Waste:

- .1 Excavation, loading, hauling, and disposal of material to the designated areas as shown in the bid table / outside of the Parks at a location determined by the Contractor.
- .2 Obtaining, maintaining and reclamation of a disposal site outside of the Parks and all incidentals associated with the removal and disposal of waste.
- .5 In addition to incidental items, no measure for payment will be made for:
  - .1 Stripping below the design ditch grade.
  - .2 Excavating and/or construction embankments unnecessarily beyond design lines established by Departmental Representative, with exception of unavoidable slide material. Do not measure slide material, when such slides are attributable to negligence.
  - .3 Contractor contaminated suitable surplus materials with unsuitable materials. Contaminated unsuitable materials shall be removed from the Park at the Contractor's expense.
  - .4 Ditch or backslope overcut below the design grade line and/or filling back to design grade.
  - .5 If overcut, no payment will be made for filling an area back to grade.
  - .6 Removing unsuitable material from embankment attributable to negligence.
- .6 Mobilization and demobilization required for this Work shall be incidental to **"Lump Sum Price Item 1 – Mobilization / Demobilization"**, and no additional payment will be made.
- .7 Traffic Control required for this Work shall be incidental to **"Lump Sum Price Item 2 – Traffic Accommodation"** and no separate payment will be made to the Contractor.

#### 1.4 DEFINITIONS

- .1 Type A Solid Rock / Rock Excavation: excavation of:
  - .1 All forms of "solid rock in place" occurring in masses, ledges, seams or layers of sufficient hardness to require breaking by continuous drilling and blasting before excavation and removal.
  - .2 Detached masses of rock or boulders individually containing a volume of 2.0 cubic metres or more.
- .2 Common Excavation: excavation of materials that are not Rock Excavation or Stripping.
- .3 Borrow:
  - .1 Suitable material obtained from locations outside the limits of the roadway cut and placed as embankment material.
  - .2 Suitable material obtained from culvert foundation excavations used for the onsite production of granular material.
- .4 Stripping: excavation of organic material covering original ground.
- .5 Embankment: material derived from usable excavation and placed above original ground or stripped surface.
- .6 Waste Material: material unsuitable for embankment, embankment foundation, and material surplus to requirements.
- .7 Topsoil: material passing a 100 mm sieve and capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

## **1.5 QUALITY CONTROL**

- .1 Regulatory Requirements:
  - .1 Adhere to regulations of authority having jurisdiction when blasting is required.
  - .2 Adhere to Provincial and National Environmental requirements when potentially toxic materials are involved.
- .2 In accordance with Section 01 45 00 – Quality Control.

## **1.6 SUBMITTALS**

- .1 In accordance with Section 01 33 00 - Submittal Procedures.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 In accordance with Section 01 35 43 - Environmental Procedures.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Embankment materials require acceptance by Departmental Representative.
  - .1 The Contractor shall provide material test certificates to the Departmental Representative for consideration.
- .2 Material used for embankment not to contain more than 3% organic matter by mass, frozen lumps, weeds, sod, roots, logs, stumps or other unsuitable material.
- .3 Borrow material:
  - .1 AT - Standard Specifications for Highway Construction (latest edition)
  - .2 Imported from Contractor determined site outside of the Parks. Supply, loading, hauling, temporary stockpiling, placing, compacting and finishing considered incidental to the unit price.

## **Part 3 Execution**

### **3.1 UTILITY COORDINATION**

- .1 In accordance with Section 01 14 00 - Work Restrictions.
- .2 Coordinate relocations or protection of utilities (manholes, ducts, conduits or other associated infrastructure) with utility service providers and perform works required to complete relocation or protection. Work to be in accordance with utility service provider instruction or as directed by the Departmental Representative.
- .3 Existing buried utilities are to be located at all new culvert locations and every 100 m along segments of the Work where the utilities may be damaged by the Work, by using low impact excavation such as hydrovac or similar methods which will not damage buried utilities.
- .4 Payment for locating utilities to be incidental to the Works and no additional payment will be made.
- .5 Payment for utility relocations or protection to include all coordination efforts, labour, equipment and materials to be made under “**Lump Sum Item 3 – Prime Cost Sum**” in

accordance with Section 01 21 00 - Allowances and Section 01 14 00 - Work Restrictions.

### **3.2 COMPACTION EQUIPMENT**

- .1 Compaction equipment must equivalent of one 12 tonne vibratory packer capable of obtaining required densities in materials on project. Equipment that does not achieve specified densities must be replaced or supplemented.

### **3.3 WATER DISTRIBUTORS**

- .1 Apply water with equipment capable of uniform distribution and in accordance with Section 01 35 43 – Environmental Procedures.

### **3.4 STRIPPING OF TOPSOIL**

- .1 Commence topsoil stripping of areas on acceptance by the Departmental Representative after clearing and grubbing debris have been removed from these areas.
- .2 Stripping depth for the removal of organic material is estimated to be on average 300-400 mm but will fluctuate from one location to the other. Contamination of non-organic material will not be permitted during stripping.
- .3 Strip topsoil to depths as verified by the Departmental Representative. Do not mix topsoil with subsoil. Stripping depth will vary.
- .4 Stripping material is to be either hauled to and stockpiled in a windrow at the toe of fill or top of cut, or other location(s) as directed by the Departmental Representative. The Contractor is advised that there is limited storage area for this material on site and is required to provide stockpile locations outside of the National Parks for excess material.
- .5 Stripped soil (including fine forest litter) materials shall be placed and stored at locations and in amounts and form as instructed by the Departmental Representative, for later reclamation use on graded slopes. Stripping piles may require erosion control, sedimentation protection or stabilization, depending on the location and anticipated duration of storage. At the Departmental Representatives direction, the Contractor shall prepare a plan for management of each stripping pile.

### **3.5 EXCAVATING**

- .1 General:
  - .1 Stockpiling along the ROW outside of the cut/fill slope will not be permitted unless approval has been given by the Departmental Representative.
  - .2 Notify the Departmental Representative when waste materials are encountered and remove to depth and extent as approved by the Departmental Representative. This material shall be hauled to and stockpile at the designated pit locations.
  - .3 Subcut below subgrade elevation in cut sections only as approved by the Departmental Representative and replace with acceptable embankment material and compact. Compact top 300 mm below final subgrade elevation to minimum 100% Standard Proctor density, ASTM D698 (AASHTO T99). No subcut in ditches or backslope unless Departmental Representative approved.
  - .4 Treat ground slopes, where subgrade is on transition from excavation to embankment, at grade points in accordance with the Contract Documents.

- .5 The dimensions of the excavations and embankments shall be, in accordance with the typical sections accompanying these specifications, but the dimensions of any or all excavations and embankments may be increased or decreased at any time by the Departmental Representative as conditions and circumstances may determine.
- .2 Drainage:
  - .1 Maintain profiles, crowns and cross slopes to provide positive surface drainage at all times.
  - .2 Provide ditches as work progresses for positive drainage.
- .3 Type A / Rock excavation:
  - .1 Notify the Departmental Representative if material appearing to conform to classification for rock is encountered, to enable measurements to be made to determine volume of rock. The Contractor shall provide a minimum of 24 hours notice for the Departmental Representative to review the excavation.
  - .2 The Contractor shall submit statement of qualifications and experience of all personnel assigned to drilling and blasting duties. The driller and the blaster shall have a minimum of 5 consecutive years demonstrated experience in drilling and controlled blasting work on projects involving rock cuts over 8 m height on transportation corridors.
  - .3 The Contractor shall retain a blasting consultant, acceptable to the Departmental Representative, to provide a blast design and quality control. The blast consultant shall not be an employee of the Contractor, explosive manufacturer or explosive distributor. Prior to the pre-construction meeting, the Contractor shall provide the name and qualifications of the blasting consultant. The consultant shall have a minimum of 5 consecutive years demonstrated experience in preparation of successful blast designs along transportation corridors.
  - .4 Submit a Rock Blast Design in accordance with Section 01 33 00 – Submittal Procedures and AT Standard Specification for Highway Construction (latest edition).
  - .5 Shatter rock to 300 mm below subgrade elevation.
  - .6 Contractor shall be responsible for safety of all blasting. Particular attention should be paid to control of rock falls from excavation slopes so there is no hazard to Park users and wildlife during construction. Contractor shall advise Departmental Representative 24 hours prior to blasting operations. Contractor shall control blasting so there is no flyrock damaging existing trees and vegetation.
  - .7 All rock on cut face that is loose, hanging or that creates a potentially dangerous situation shall be removed or stabilized during or upon completion of excavation of each lift. Drilling of next lift will not be allowed until this work has been completed. Other methods such as machine scaling, hydraulic splitters or light blasting may be used in lieu of, or to supplement hand scaling.
  - .8 Controlled Blasting:
    - .1 The purpose of controlled blasting is to minimize damage to rock back slope and to help ensure long-term stability.
    - .2 Controlled blasting will involve controlled use of explosives and blasting accessories in carefully spaced and aligned drill holes to



produce a free surface or shear plane in rock along specific excavation backs slope. Controlled blasting techniques will be used for this project.

- .3 The slopes of the cut shall be scaled of all loose material and ditches shall be formed and cleaned.
- .4 Subgrade shall be constructed to a true and uniform surface as to line and grade preparatory to application of sub-base material.
- .4 Borrow Excavation:
  - .1 Completely use in embankments, suitable materials removed from right-of-way excavations before taking material from borrow areas.
  - .2 Obtain embankment materials, in excess of what is available from cut areas, from designated borrow areas.
  - .3 Remove waste and stripping material from borrow pits to designated locations.
  - .4 Slope edges of borrow areas to minimum 3:1 and provide drainage as directed.
  - .5 Trim and leave borrow pits in condition to permit accurate measurement of material removed.

### 3.6 EMBANKMENTS

- .1 This item consists of the construction of the subgrade in embankments and cuts to the lines, grades, cross-sections and dimensions as per the Contract Documents.
- .2 Scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces. Method used to be subject to prior approval of the Departmental Representative.
- .3 Do not place material that is frozen nor place material on frozen surfaces except in areas authorized.
- .4 Maintain crowned surface during construction to ensure ready run-off of surface water.
- .5 Drain low areas before placing materials.
  - .1 Place and compact to full width in layers not exceeding 200 mm loose thickness. The Departmental Representative may authorize thicker lifts if specified compaction can be achieved and if material contains more than 25% by volume stone and rock fragments larger than 100 mm.
- .6 Rock Embankments:
  - .1 Place to full width in layers of sufficient depth to contain maximum sized rocks, but in no case is layer thickness to exceed 0.7 m.
  - .2 Distribute rock material to fill voids with smaller fragments to form compact mass.
  - .3 Fill surface voids at design elevation with rock spalls or selected material to form earth-tight surface.
  - .4 The Contractor may place rock embankments during freezing conditions provided compaction equipment of sufficient size to break large rock particles is used and all snow and ice is removed from fill surface.
- .7 Deductions from excavation will be made for overbuild of embankments.
- .8 Excess Excavation placed in stockpile in the designated pits:

- .1 Material in the quantities specified shall be placed in the designated pits or as otherwise directed by the Departmental Representative.
- .2 The Contractor shall place, grade and track pack the material in stockpile as necessary to allow for construction access and the movement of equipment.
- .3 The Contractor shall maintain access to the stockpile area and allow for access to the stockpiled material by other.
- .4 Materials placed in the designated pits, once accepted by the Departmental Representative, are the property of PCA.

### **3.7 SUBGRADE COMPACTION**

- .1 Break material down to sizes suitable for compaction and mix for uniform moisture to full depth of layer.
- .2 Embankment material shall be placed in successive uniform layers over the entire area as follows:
  - .1 Material containing less than 25 percent by volume of stones larger than 100 mm shall be constructed in successive horizontal layers not exceeding 200 mm in loose thickness except that the top 500 mm shall be constructed in layers not exceeding 100 mm in loose thickness
  - .2 Material containing 25 percent or more by volume of stones larger than 100 mm shall be placed in layers not exceeding the maximum size of the stones. Stones larger than 100 mm shall not be placed within 150 mm of the subgrade elevation.
  - .3 In embankments composed principally of material obtained from rock cuts, the larger stones shall be carefully distributed and the interstices filled with smaller stones and other material to form a compact mass. Such embankments shall be constructed in layers not exceeding 0.7 metre. The placing of individual rocks and boulders exceeding 0.7 metres in least dimension will be permitted provided they are carefully distributed and the interstices filled with finer material to form a dense and compact mass. Each layer, before starting the next, shall be levelled and smoothed with suitable equipment. Hauling and spreading equipment shall be operated over the full width of each layer.
- .9 Each layer shall be brought to its required degree of compaction throughout its entire width before successive layers are placed.
- .10 Compact each layer to minimum 95% Standard Proctor density, ASTM D698 (AASHTO T99). Top 300 mm of subgrade to be compacted to 100% Standard Proctor density, ASTM D698 (AASHTO T99).
- .11 Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.
- .12 For rock placed as fill, compact with large steel wheeled or tracked equipment of sufficient size to break larger particles. Compact until rock fill is stable under compaction equipment and all voids are filled.

### **3.8 PROOF ROLLING**

- .1 Finished subgrade must not rut or deflect 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

600 kPa. The prepared subgrade shall receive one complete coverage by the tires of a truck as specified.

- .2 Proof roll subgrade. If use of non-standard proof rolling equipment is approved, Departmental Representative to accept level of proof rolling.
- .3 Where proof rolling reveals areas of defective subgrade:
  - .1 Remove subgrade material to depth and extent as directed by Departmental Representative.
  - .2 Backfill excavated subgrade with suitable Common material and compact in accordance with Section 31 24 13 – Roadway and Drainage Excavation.
  - .3 Replace subgrade material and compact in accordance with the Contract Documents.
- .4 All associated Works, including replacing defective material with new materials in accordance with the appropriate Sections is to be done at the Contractor's cost.

### **3.9 FINISHING**

- .1 Shape entire subgrade to within  $\pm 15$  mm of design elevations but not to be uniformly high or low.
- .2 Round top of back slope as shown on the Drawings.
- .3 Remove rocks over 150 mm in dimension from slopes and ditch bottoms.
- .4 Trim between constructed slopes and edge of clearing to provide drainage.

### **3.10 PROTECTION**

- .1 Maintain finished surfaces in condition conforming to this section until acceptance by the Departmental Representative.

**END OF SECTION**

## **31 32 19 GEOTEXTILES**

### **Part 1 General**

#### **1.1 DESCRIPTION**

- .1 Supply and installation of Geotextiles including but not limited to non-woven geotextile, geo-grid, silt fences, and geosynthetic berms as required to complete the Work as specified in the Contract Documents and as directed by the Departmental Representative.

#### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  - .2 ASTM D4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
  - .3 ASTM D4716, 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, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
  - .5 ASTM A123 / A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-4.2 No. 11.2-M89(R2013), 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 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .4 AT - Standard Specifications for Highway Construction (latest edition)
- .5 AT - Standard Specifications for Bridge Construction (latest edition)

### **1.3 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 The supply and installation of Geotextiles including but not limited to non-woven geotextile, geo-grid, silt fences, and geosynthetic berms will not be measured directly for payment and shall be considered incidental to the unit price items.

### **1.4 QUALITY CONTROL**

- .1 In accordance with Section 01 45 00 - Quality Control.

### **1.5 SUBMITTALS**

- .1 Submit samples in accordance with 01 33 00 – Submittal Procedures for each type of geotextile used.
- .2 Submit copies of mill test data and certificates in accordance with Section 01 33 00 – Submittal Procedures.

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

- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.
- .2 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.

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

- .1 In accordance with Section 01 35 43 - Environmental Procedures.
- .2 Unused geotextiles to be removed from the Parks at the Contractor's expense.

## **Part 2 Products**

### **2.1 MATERIAL**

- .1 Nonwoven geotextile shall meet or exceed the specifications of Nilex 4552 Non-Woven Geotextile. If the Contractor wishes to propose an alternate non-woven geotextile, the approval is subject to the discretion of the Department Representative.

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Filter Fabric for Riprap area 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 Pin successive strips of geotextile with securing pins at 3m intervals.

- .6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .7 Replace damaged or deteriorated geotextile to approval of Departmental Representative.
- .8 Place and compact Riprap in accordance with Section 31 37 00 - Riprap.
- .9 Install as per manufacturers specifications.

### **3.2 PROTECTION**

- .1 Vehicular traffic not permitted directly on geotextile.

**END OF SECTION**

## **31 37 00 RIPRAP**

### **Part 1 General**

#### **1.1 DESCRIPTION**

- .1 Supply and installation / Installation of Owner supplied Riprap for culvert end treatments as required to complete the Work as specified in the Contract Documents and as directed by the Departmental Representative.

#### **1.2 REFERENCES**

- .1 AT - Standard Specifications for Highway Construction (latest edition).

#### **1.3 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Measure for payment of supplied and installed Riprap shall be the number of tonnes as totalled on scale tickets in accordance with the Contract Documents and accepted by the Departmental Representative.
  - .1 Scale tickets to be provided to the Departmental Representative within 24 hours of the Riprap being delivered to site.
- .2 Payment for the supply and placement of AT Class 1M Riprap will be made incidental to **“Unit Price Item 11 – Pipe Culverts”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .3 Items considered incidental to the Work include, but are not limited to:
  - .1 Overhaul.
  - .2 Excavation, preparation of Riprap base, geotextiles, and any other related materials.
  - .3 Testing of Riprap.
  - .4 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
- .4 A conversion rate of 2 tonnes / cubic metre will be used for converting Riprap quantities, if required.
- .5 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”**, and no additional payment will be made.
- .6 Traffic Control required for this Work shall be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”** and no separate payment will be made to the Contractor.

#### **1.4 QUALITY CONTROL**

- .1 In accordance with Section 01 45 00 - Quality Control.

#### **1.5 SUBMITTALS**

- .1 In accordance with Section 01 33 00 Submittal Procedures.



## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 In accordance with Section 01 35 43 - Environmental Procedures.
- .2 Remove materials defined as hazardous or toxic and dispose of outside of the Parks.

## **Part 2 Products**

### **2.1 STONE**

- .1 Hard, dense with specific gravity not less than 2.60, free from seams, cracks or other structural defects, to meet following Class for use intended:
  - .1 Only non-acid generating and non-metal leaching rock is suitable.
  - .2 Stone Riprap will be obtained from suitable onsite rock excavation locations. The Contractor will be responsible for sorting of Riprap and delivering to the sites where Riprap is required.
  - .3 Riprap for Culverts inlet / outlet, spillways and barrier drains:
    - .1 AT Class 1M Riprap
- .2 Suitable Riprap material to be sourced from outside of the Parks (or) from Rock excavation and delivered to the sites where Riprap material is required.

## **Part 3 Execution**

### **3.1 INSTALLATION OF RIPRAP**

- .1 Contractor shall do the layout for placement of Riprap.
- .2 Where Riprap is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated.
- .3 Place Geotextile, as applicable, in accordance with Section 31 32 19 - Geotextiles.
- .4 Fine grade area where Riprap is to be placed, to a uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.
- .5 Place Riprap (by machine or by hand) to thickness and details as indicated or as agreed to by the Departmental Representative.
- .6 Place stones in manner accepted by Departmental Representative to secure surface and create a stable mass or to match existing Streambed. On slopes, place larger stones at bottom of slopes.
- .7 Hand placing Riprap:
  - .1 Use larger stones for lower courses and as headers for subsequent courses.
  - .2 Stagger vertical joints and fill voids with rock spalls or cobbles.
  - .3 Finish surface evenly, free of large openings and neat in appearance.

**END OF SECTION**

## 32 11 24 GRANULAR BASE COURSE

### Part 1 General

#### 1.1 DESCRIPTION

- .1 AT Granular Base Course for use in roadway construction as shown in the Contract Documents and as directed by the Departmental Representative.

#### 1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM C117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
  - .5 ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft<sup>3</sup>) (2,700kN-m/m<sup>3</sup>).
  - .6 ASTM D1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  - .7 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 AT - Standard Specifications for Highway Construction (latest edition)

#### 1.3 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Measure for payment of AT Granular Base Course shall be in neat line cubic meter volumes calculated from the Design cross sections for work completed in accordance with the Contract Documents and accepted by the Departmental Representative.
  - .1 Payment for AT Designation 2 Class 40 Subbase Course Aggregate for use in base course construction shall be made under the applicable item of **“Unit Price Item 5a – AT Designation 2 Class 40 Base Course Aggregate”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
  - .2 Payment for AT Designation 2 Class 20 Subbase Course Aggregate for use in base course construction shall be made under the applicable item of **“Unit Price Item 5a – AT Designation 2 Class 20 Base Course Aggregate”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials,

equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.

- .2 Items considered incidental to the Work include, but are not limited to:
  - .1 Supply, loading, hauling, placing, compacting, water for compaction, drying of material and finishing.
  - .2 Overhaul.
  - .3 Any temporary stockpiling of aggregates onsite.
  - .4 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
- .3 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”**, and no additional payment will be made.
- .4 Traffic Control required for this Work shall be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”** and no separate payment will be made to the Contractor.

#### 1.4 QUALITY CONTROL

- .1 In accordance with Section 01 45 00 – Quality Control.
- .2 Contractor to provide material samples to the Departmental Representative prior to works commencing for Quality Assurance purposes.

#### 1.5 SUBMITTALS

- .1 In accordance with Section 01 33 00 Submittal Procedures.

#### 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 In accordance with Section 01 35 43 - Environmental Procedures.
- .2 Divert unused granular material to outside of the National Parks as accepted by Departmental Representative.

### Part 2 Products

#### 2.1 MATERIALS

- .1 AT - Standard Specifications for Highway Construction (latest edition).
- .2 / AT Designation 2 Class 20 Base Course Aggregate to be supplied by the Contractor from outside the Park or produced from suitable material excavated from within the roadway cuts and structure excavations.
- .3 AT Designation 2 Class 40 Base Course Aggregate to be supplied by the Contractor from outside the Park or produced from suitable material excavated from within the roadway cuts and structure excavations.

### **Part 3 Execution**

#### **3.1 PLACING**

- .1 Load, haul and place base aggregate after sub-base aggregate surface is inspected and accepted by Departmental Representative.
- .2 Placing
  - .1 Construct base aggregate to depth and grade in areas indicated.
  - .2 Ensure no frozen material is placed.
  - .3 Place material only on clean unfrozen surface, free from snow and ice. For each lift, material shall be placed on crown line using a Tonne / metre spreadsheet. Contractor shall have a checker to indicate spread distance when material is being placed.
  - .4 Begin spreading base aggregate on crown line or on high side of one-way slope.
  - .5 Place material using methods that do not lead to segregation or degradation of aggregate.
  - .6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds that will place material in uniform layers of required thickness.
  - .7 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts if specified compaction can be achieved.
  - .8 Shape each layer to smooth contour and compact to the specified density before succeeding layer is placed.
  - .9 Remove and replace that portion of layer in which material becomes segregated during spreading.

#### **3.2 COMPACTION**

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Compact to density not less than 100% Standard Proctor density in accordance with ASTM D698.
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .4 Apply water as necessary during compacting to obtain specified density.
- .5 Dry as necessary to obtain specified compaction.
- .6 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- .7 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

#### **3.3 PROOF ROLLING**

- .1 Granular Base Course must not rut or deflect 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 600 kPa. Each compacted course of base course aggregate shall receive one complete coverage by the tires of a truck as specified.

- .2 Proof roll Granular Base Course. If use of non-standard proof rolling equipment is approved, Departmental Representative to accept level of proof rolling.
- .3 Where proof rolling reveals areas of defective Granular Base Course or subgrade:
  - .1 Remove Gravel fill and subgrade material to depth and extent as directed by Departmental Representative.
  - .2 Backfill excavated subgrade with suitable Common material and compact in accordance with Section 31 24 13 – Roadway and Drainage Excavation.
  - .3 Replace Gravel fill and/or Granular Base Course material and compact in accordance with the Contract Documents.
- .4 All associated Works, including replacing defective material with new materials in accordance with the appropriate Sections is to be done at the Contractor's cost.

### **3.4 SITE TOLERANCES**

- .1 Finished base surface to be within +/- 10 mm of established grade and cross section but not uniformly high or low.
- .1 Finished sub-base surface to be within +/- 15 mm of elevation as indicated but not uniformly high or low.

### **3.5 PROTECTION**

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied.

### **END OF SECTION**

## **32 12 14 ASPHALT TACK COAT**

### **Part 1 General**

#### **1.1 DESCRIPTION**

- .1 Supply and application of a liquid asphalt to ensure a bond between the surface being paved and the Asphalt Concrete Pavement lift, in accordance with the Contract Document and as directed by the Departmental Representative.

#### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM D140, Standard Practice for Sampling Bituminous Materials.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.
- .3 AT - Standard Specifications for Highway Construction (latest edition)

#### **1.3 MEASUREMENT AND PAYMENT PROCEDURES**

- .1 Supply, delivery and application of tack coat will not be measured separately and will be incidental to “**Unit Price Item 6 – Asphalt Concrete Pavement - EPS**” and shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.

#### **1.4 SUBMITTALS**

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit two 1 L samples of asphalt tack coat material proposed for use in new, clean, airtight, sealed, wide mouth bottles made with plastic to Departmental Representative, at least 2 weeks prior to beginning Work.
- .3 Sample asphalt tack coat material to: ASTM D140.
- .4 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into Work, in accordance with ASTM D140.

#### **1.5 QUALITY CONTROL**

- .1 In accordance with Section 01 45 00 – Quality Control.
- .2 Upon request by Departmental Representative, submit manufacturer's test data and certification that asphalt tack coat material meets requirements of this Section.

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

- .1 Deliver, store and handle materials in accordance with ASTM D140.
- .2 Provide, maintain and restore asphalt storage area.

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

- .1 In accordance with Section 01 35 43 - Environmental Procedures.

- .2 Divert unused asphalt materials to facility capable of recycling materials outside of the National Parks.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Anionic emulsified asphalt: to CAN/CGSB-16.2, grade: SS-1.
- .2 Water: clean, potable, free from foreign matter.

### **2.2 EQUIPMENT**

- .1 Pressure distributor to be designed, equipped, maintained and operated so that asphalt material can be:
  - .1 Maintained at even temperature.
  - .2 Applied uniformly on variable widths of surface up to 5 m.
  - .3 Applied at readily determined and controlled rates from 0.2 to 5.4 L/m<sup>2</sup> with uniform pressure, and with an allowable variation from any specified rate not exceeding 0.1 L/m<sup>2</sup>.
  - .4 Distributed in uniform spray without atomization at temperature required.
  - .5 Equipped with meter, registering metres of travel per minute, visibly located to enable truck driver to maintain constant speed required for application at specified rate.
  - .6 Equipped with pump having flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator. Pump power unit to be independent of truck power unit.
  - .7 Equipped with an easily read, accurate and sensitive device that registers temperature of liquid in reservoir.
  - .8 Equipped with accurate volume measuring device or calibrated tank.
  - .9 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation.
  - .10 Equipped with nozzle spray bar, with operational height adjustment.
  - .11 Cleaned if previously used with incompatible asphalt material.

## **Part 3 Execution**

### **3.1 APPLICATION**

- .1 Obtain Departmental Representative's approval of surface before applying asphalt tack coat.
- .2 Apply asphalt tack coat only on clean and dry surface.
- .3 Dilute asphalt emulsion with water at 1:1 ratio for application.
  - .1 Mix thoroughly by pumping or other method accepted by Departmental Representative.
- .4 Apply asphalt tack coat evenly to pavement surface at rate as directed by Departmental Representative, of 0.5 L/m<sup>2</sup> plus or minus 0.2 L/m<sup>2</sup>.



- .5 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.
- .6 Do not apply asphalt tack coat when air temperature is less than 10 degrees Celsius or when rain is forecast within 2 hours of application.
- .7 Apply asphalt tack coat only on unfrozen surface.
- .8 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Departmental Representative.
- .9 Where traffic is to be maintained, treat no more than one half of width of surface in one application.
- .10 Keep traffic off tacked areas until asphalt tack coat has set.
- .11 Re-tack contaminated or disturbed areas as directed by Departmental Representative.
- .12 Permit asphalt tack coat to set before placing asphalt pavement.

**END OF SECTION**

## **32 12 16 ASPHALT CONCRETE PAVEMENT (EPS)**

### **Part 1 General**

#### **1.1 DESCRIPTION**

- .1 Work shall consist of supplying, loading, hauling and placing AT Mix Type H1 Asphalt Concrete Pavement (EPS) as per the Contract Documents, or as directed by the Departmental Representative
- .2 For the asphalt mix, asphalt aggregate used shall consist of a 16mm Medium Mix Asphalt Aggregate in accordance with AT – Standard Specifications for Highway Construction Section (latest edition)
- .3 Supply of AT Designation 1 Class 16 (16mm) asphalt aggregate.
- .4 Asphalt Cement used shall be PG 58-28 in accordance with AT – Standard Specifications for Highway Construction (latest edition).
- .5 Recycled Asphalt Pavement (RAP) will be permitted, up to 10% in the asphalt pavement mix design in accordance with this Section.
- .6 Perform and submit mix designs for AT Mix Type H1 Asphalt Concrete Pavement using Asphalt Cement PG 58-28 and 16mm Asphalt Aggregate. Mix design is subject to acceptance by the Departmental Representative.
- .7 Milled Rumble Strips to be installed as detailed herein and as directed by the Departmental Representative.
- .8 Acceptance and/or rejection of all placed Asphalt Concrete Pavement shall be determined in accordance with the End Product Specifications.

#### **1.2 REFERENCES**

- .1 AT - Standard Specifications for Highway Construction (latest edition)

#### **1.3 MEASUREMENT AND PAYMENT PROCEDURES**

##### **.1 Asphalt Concrete Pavement**

- .1 Measure for payment of Asphalt Concrete Pavement will be in tonnes by scale tickets submitted to and accepted by the Departmental Representative in accordance with the Contract Documents.
- .2 Payment for accepted Asphalt Concrete Pavement will be made under “**Unit Price Item 6a - Asphalt Concrete Pavement (EPS) – AT Mix Type H1 – 16mm**)” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .3 Level Course shall not be measured separately for payment but will be paid under “**Unit Price Item 6a - Asphalt Concrete Pavement (EPS) – AT Mix Type H1 – 16mm**)”.

##### **.2 Unit Price Adjustments**

- .1 Applicable unit price payment adjustments (additions or subtractions as applicable) shall be in accordance with AT – Standard Specifications for Highway Construction Section 3.50 – Asphalt Pavement Construction (EPS).

- .1 With the exception of:
  - .1 Testing and Evaluation of Finished Pavement Surface Smoothness Using International Roughness Index (IRI) Criteria which shall be as defined in Alberta Transportation's Special Provision SP\_S301, and any current Special Provisions.
  - .2 Smoothness testing to be arranged by the Departmental Representative.
  - .3 Application Rate unit price payment adjustments to be in accordance with BC MoTI - Standard Specifications for Highway Construction Section 502 – Asphalt Pavement Construction (EPS).
  - .4 Applicable unit price adjustments for Level Course shall apply only for Asphalt Content and Gradation.
- .2 Payments shall be under **“Lump Sum Price Item 3 – Prime Cost Sum”**.
- .3 **Reclaimed Asphalt Pavement**
  - .1 Production and usage of Reclaimed Asphalt Pavement (RAP) shall be considered incidental to **“Unit Price Item 6a – Asphalt Concrete Pavement – EPS – AT Mix Type H1 – 16mm”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .4 **Milled Rumble Strips**
  - .1 Measure for payment for the installation of Milled Rumble Strips shall be per lineal kilometer installed as per the Contract Documents as accepted by the Departmental Representative.
  - .2 Payment shall be made under **“Unit Price Item 6b – Asphalt Concrete Pavement (EPS) - Milled Rumble Strips”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .5 Items considered incidental to the Work include, but are not limited to:
  - .1 Production of asphalt aggregate.
  - .2 The movement of equipment and crew.
    - .1 A move is defined as the Contractor moving equipment and crew to the next section to pave after having completed, in its totality, the previous section.
  - .3 Cleaning of existing pavement prior to paving, whether via sweeping or other methods.
  - .4 Survey and layout for asphalt concrete paving and milled rumble strips.
  - .5 Preparing asphalt mix designs (including anti-stripping test), in accordance with Section 01 45 00 Quality Control and Section 01 33 00 Submittal Procedures.
  - .6 Supply, delivery and incorporation of asphalt cement.
  - .7 Anti-stripping agent(s) and other additives, if required and accepted by the Departmental Representative.

- .8 Supply, installation, maintenance, calibration of weight scales and a scale house, or alternately electronic calibrated silo scales, at the plant by the Contractor.
  - .1 Contractor shall provide a scale person, as required, at their cost.
- .9 Asphalt Concrete Pavement placing at milled tie-in locations
- .10 Cleaning of existing pavement shoulder, whether via sweeping or other methods
- .11 Adjustment of existing catch basin grates and manhole lids as accepted by the Departmental Representative
- .12 Sloped paved shoulders as described in this Section.
- .13 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures
- .14 Collection, storage, removal and disposal of asphalt plant dust outside of the National Parks.
- .15 Overhaul.
- .6 Traffic Control required for this Work shall be incidental to **“Lump Sum Price Item 2 - Traffic Accommodation”** and no separate payment will be made to the Contractor.
- .7 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”** and no additional payment will be made.

#### 1.4 SUBMITTALS

- .1 In accordance with Section 01 33 00 Submittal Procedures.

#### 1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 In accordance with Section 01 35 43 - Environmental Procedures.

### Part 2 Products

#### 2.1 MATERIALS

- .1 PG 58-28 Asphalt Cement shall be used.
- .2 Asphalt Aggregate:
  - .1 Materials used shall be in accordance with AT Standard Specifications for Highway Construction Section 3.50 (latest edition).
  - .2 AT Designation 1 Class 16 Asphalt Aggregate is to be supplied from outside the Park
- .3 RAP to be processed by crushing and/or screening into a consistent material with uniform gradation, AC content and other properties prior to being utilized in accordance with the AT Standard Specifications for Highway Construction Section 3.50 (latest edition).
  - .3 Use of processed Reclaimed Asphalt Pavement (RAP) material in hot mix asphalt construction is permitted to maximum 10% in accordance with AT Standard Specifications for Highway Construction Section 3.50 (latest edition) and as approved by the Departmental Representative.
  - .4 Only RAP sourced from Highway 16 shall be considered. Only Classified RAP will be permitted.

- .5 The Contractor shall fulfill or exceed the requirements of the AT Standard Specifications for Highway Construction from the time of collection through processing, mix design, and quality control practices during the production of asphalt mixtures containing RAP as confirmed through the Contractor's Quality Control documentation.
- .6 RAP testing is required in accordance with AT Standard Specifications for Highway Construction Section 3.50 (latest edition).
- .7 The Contractor shall process and crush the RAP so as to ensure compliance with all gradation requirements of their approved Job Mix Formula.
- .4 All additives (including anti-stripping agents) to be in accordance with the Approved Products List as published by AT.

### **Part 3 Execution**

#### **3.1 QUALITY CONTROL**

- .1 In accordance with Section 01 45 00 - Quality Control.
- .2 Contractor is responsible for all Quality Control required in accordance with AT Standard Specifications for Highway Construction Section 3.50 (latest edition) and Section 01 45 00 – Quality Control.
- .3 Contractor is to provide a full time Road Checker during all times of asphalt placement that shall be responsible for providing a daily Road Checker's Summary in accordance with AT Standard Specifications for Highway Construction Section 3.50 (latest edition).
- .4 The Road Checker's Summary shall be provided to the Departmental Representative no less than 24 hrs after the relevant shift end.
- .5 To assist in the Road Checker's role, the Contractor shall layout and stake stations at the appropriate intervals to achieve the desired accuracy throughout the Work Site. All survey and marking stakes shall be removed prior to completion of the Works.
- .6 The method of tests for asphalt appeal samples shall be the same method of tests conducted as during Quality Control / Quality Assurance testing.

#### **3.2 METHODOLOGY**

- .1 ACP placement:
  - .1 Asphalt concrete mix shall not be placed when the air temperature is below 4°C, or when rain is forecasted.
  - .2 Asphalt concrete mix shall be placed only on clean, dry, and unfrozen surfaces.
  - .3 Unless otherwise shown on the plans, the asphalt concrete mix shall be placed in the following lift thicknesses:
    - .1 in a single lift when the design compacted total thickness is 75 mm or less.
    - .2 in two or more lifts when the design compacted total thickness is greater than 75 mm. The lift thickness selection shall be determined by the Contractor except that:
      - .1 the maximum thickness of any lift shall be 75 mm.
      - .2 the minimum thickness of a final lift shall be 50 mm.

- .3 On widenings, the thickness of asphalt concrete mix up to 75 mm may be placed in one lift. Over 75 mm thickness, the asphalt concrete shall be placed in two or more lifts.
- .4 A pickup machine shall be used for all mainline highway lane paving.
- .2 The edge of pavement shall have sloped paved shoulders following the existing side slope for the length of the paving limits, except where there is guardrail or concrete barrier, and shall be constructed in conjunction with all lifts of ACP, as shown in the Contract Documents or as directed by the Departmental Representative.
- .3 Milled Rumble Strips shall be installed in accordance with BC MoTI – Supplement to TAC Geometric Design Guide Section 650 – Rumble Strips. The Milled Rumble Strips shall be continuous SRS and are to be installed at various locations along Highway 16 or as directed by the Departmental Representative.
- .1 Contractor to provide layout of rumble strips, including starts and ends, in accordance with the Contract Documents.
- .2 Contractor's Quality Control to be present during all stages of this Work.

### **3.3 EQUIPMENT, PLANT AND MIXING REQUIREMENTS**

- .1 Execution of the Work shall be in accordance with AT - Standard Specifications for Highway Construction (latest edition).
- .2 The Contractor will not be permitted to setup a Mobile Asphalt Plant or use a Stationary Asphalt Plant in the National Park for this Project..
- .3 Asphalt plant to be used on this project, regardless of location, shall be a minimum of 200 tonne per hour production plant, equipped with a dry bag system for pollution control, in addition to, or in replacement of standard cyclone dust collectors, to effectively eliminate emissions of dust and smoke pollutants into the atmosphere. Use of secondary dust collection systems, requiring discharge of dust polluted water into settling ponds or drainage system will not be permitted. In addition, Asphalt plant must comply with all environmental pollution control regulations applicable in the asphalt plant area. The plant operator must make daily inspections of the emission control components, to ensure proper working order and provide the most recent stack monitoring results for viewing by the Departmental Representative or their designate.

**END OF SECTION**

## 32 17 23 PAVEMENT MARKING

### Part 1 General

#### 1.1 DESCRIPTION

- .1 Supply and installation of Pavement Markings in areas in accordance with the Contract Document and as directed by the Departmental Representative.
- .2 The Contractor shall complete a survey of the pre-existing pavement markings prior to their disturbance to ensure their ability to re-instate them accurately.

#### 1.2 REFERENCES

- .1 CAN/CGSB-1.5-M99 Low Flash Petroleum Spirits Thinner.
- .2 CGSB1-GP-12C-83 Standard Paint Colours.
- .3 CGSB1-GP-71-83 Method, of Testing Paints and Pigments.
- .4 CAN/CGSB 1.74-01 Alkyd Traffic Paint.
- .5 U.S. FED-STD-595B, 1989 – Colours Used in Government Procurement.
- .6 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .7 AT Standard Specification for Highway Construction (current edition)
- .8 AT Design Bulletin #18/2003
- .9 AT Typical Drawings
  - .1 CB6-3.52M1
  - .2 CB6-3.52M3
  - .3 CB6-3.52M4

#### 1.3 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Measure for payment for final line painting shall be in linear metres along the centre of the paint line regardless of width or line-gap ratio in accordance with the Contract Documents and accepted by the Departmental Representative.
- .2 Double center lines are to be measured as one line.
  - .1 Payment will be made under “**Unit Price Item 7a – Pavement Marking - Line Painting**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .3 Arrow markings shall be measured for payment per unit completed, regardless of the specific type or size in accordance with the Contract Documents and accepted by the Departmental Representative.
  - .1 Payment will be made under “**Unit Price Item 7b – Pavement Marking – Arrows**” and shall include all labour, equipment and material to complete the work.



- .4 Removal of existing paint lines shall be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**, in accordance with Section 01 35 31 – Special Procedures for Traffic Control, and no separate payment will be made to the Contractor.
- .2 Items considered incidental to the Work include, but are not limited to:
  - .1 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
  - .2 Survey and layout.
  - .3 Repair or removal and replacement of incorrect pavement markings as directed by the Departmental Representative shall be completed at the Contractor’s cost.
  - .4 Final design Pavement Marking layout by string line, surveyor or other methods accepted by the Departmental Representative.
  - .5 Temporary Pavement Marking in accordance with Section 01 35 31 - Special Procedures for Traffic Control.
- .5 Traffic Control required for this Work shall be incidental to **“Lump Sum Price Item 2 - Traffic Accommodation”** and no separate payment will be made.
- .6 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”** and no additional payment will be made.

#### 1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative following material sample quantities in accordance with Section 01 33 00 – Submittal Procedures.
  - .1 Two samples of each type of paint.
  - .2 One sample of glass beads.
  - .3 Sampling to CGSB1-GP-71.
- .3 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, CGSB specification number and formulation number and batch number.

#### 1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 In accordance with Section 01 35 43 - Environmental Procedures.

### Part 2 Products

#### 2.1 MATERIALS

- .1 Paint:
  - .1 To CGSB 1.74-2001-CAN/CGSB, alkyd traffic paint.
  - .2 Colour: to FED-STD-595B, yellow 33538 and white 37925.
  - .3 Upon request, Departmental Representative will supply a qualified product list of paints applicable to work. Qualified paints may be used but Departmental Representative reserves right to perform further tests.
- .2 Thinner: to CAN/CGSB-1.4-2000.

- .3 Glass beads:
  - .1 Overlay type: to CGSB1-GP-74M.

## **2.2 DELIVERY, STORAGE AND HANDLING**

- .1 Storage and handling shall meet the requirements of Section 01 35 43 - Environmental Procedures and Section 02 81 01 - Hazardous Materials.
- .2 The Contractor shall make all arrangements for the supply and delivery of paint and glass beads and shall provide the Departmental Representative with records of all materials received and/or returned, on a daily basis.
- .3 The Contractor shall provide, maintain and reclaim all material storage sites.
- .4 No paint formulation shall be diluted or mixed with a different formulation or with any other material, without the specific approval of the Departmental Representative.
- .5 The Contractor shall take all necessary steps to prevent contamination of the materials. Paint shall be protected from freezing.
- .6 The Contractor shall be responsible for the proper clean-up of waste or spilled material, and the proper disposition of containers.

## **Part 3 Execution**

### **3.1 TEMPORARY MARKINGS**

- .1 The Contractor shall supply and place temporary line markings on newly constructed hard surfaces (pavement, sealcoat, etc.) throughout the project, re-establishing centreline and all lane-dividing lines prior to being opened to traffic, and shall maintain such markings until the earlier of the Actual Completion Date or the date Permanent markings have been placed. Temporary line markings are not required for lane edge lines (fog lines) unless otherwise directed by the Departmental Representative.
- .2 Temporary line markings must be placed on an offset from the permanent lane marking and must be removed once permanent markings are in place.
- .3 Centreline of undivided highway shall be marked throughout as "no passing" unless otherwise directed by the Departmental Representative.
- .4 Painted temporary lines are not permitted on the final surface.
- .5 Pavement markings for traffic detours shall be in accordance with Part 2 Products.

### **3.2 PERMANENT MARKINGS**

- .1 Prior to any work affecting pavement markings, the Contractor shall pick-up survey all key control points of existing markings at intersections, turn slots, exit tapers and similar features and, upon completion of the final hard surfacing, re-establish those points, unless shown otherwise in the Contract Documents or directed by the Departmental Representative.
- .2 Further to the key control pick-up, the Contractor shall also pick-up survey all Transverse and Chevron and Crosshatch Pavement Markings and upon completion of the final hard surfacing, re-establish those points, unless shown otherwise on the IFC drawings or directed by the Departmental Representative.

- .3 All layout markings shall be done with white or yellow centreline paint which will be clearly visible after exposure to all Site Conditions for a minimum period of two (2) months past the Actual Completion Date.
- .4 Key control points shall be marked at their design location within tolerances of  $\pm 50\text{mm}$  transversely and  $\pm 100\text{mm}$  longitudinally. Longitudinal tolerances for intermediate points, when required, are  $\pm 10\text{mm}$ .
- .5 Permanent pavement markings are to be reinstated within two (2) weeks of paving completion, or earlier as acceptable to the Departmental Representative.

### **3.3 TOLERANCE**

- .1 All painted lines shall not exceed a dimensional width of 110 mm for specified 100 mm wide line. No tolerance below 100 mm is allowed for the specified 100 mm wide line.
- .2 All painted lines shall not exceed a dimensional width of 210 mm for specified 200 mm wide line. No tolerance below 200 mm is allowed for the specified 200 mm wide line.
- .3 All painted direction dividing, lane dividing or continuity lines shall not exceed a maximum dimensional length deviation of  $\pm 100\text{ mm}$  for specified 3 m length of line.
- .4 All spaces between painted direction dividing, lane dividing or continuity lines shall not exceed a maximum dimensional length deviation of  $\pm 100\text{ mm}$  for specified 6 m or 3 m length of space.
- .5 All paint shall be applied at the proper locations in accordance with the Contract Documents or as directed by the Departmental Representative.
- .6 All paint and glass beads shall be uniformly applied.
- .7 All painted lines shall be uniform in thickness and free of tire tracking, with no splatter, excessive overspray or other defects.
- .8 Remove incorrect markings as directed by the Departmental Representative at Contractor's cost.
  - .1 Blackout painting for incorrect lane marking will not be permitted. Incorrect paint work must be eradicated and re-painted by method approved by the Departmental Representative.

### **3.4 EQUIPMENT REQUIREMENTS**

- .1 Paint applicator to be an approved pressure type mobile distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated, and to have positive shut-off.
- .2 Distributor to be capable of applying reflective glass beads as an overlay on freshly applied paint.

### **3.5 CONDITION OF SURFACES**

- .1 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.

### **3.6 APPLICATION**

- .1 Pavement markings to be laid out by Contractor.

- .2 Apply paint only when air temperature is above 10°C, wind speed is less than 60 km/h and no rain is forecast within next 4 h.
- .3 Apply traffic paint evenly at rate of 3 L/m<sup>2</sup>.
- .4 Do not thin paint.
- .5 Paint lines to be of uniform colour and density with sharp edges.
- .6 Thoroughly clean distributor tank before refilling with paint of different colour.
- .7 Apply glass beads at rate of 200 g/m<sup>2</sup> of painted area immediately after application of paint.

### **3.7 REMOVAL, REPAIR OR REPLACEMENT OF UNACCEPTABLE PAVEMENT MARKINGS**

- .1 All painted lines that do not meet the requirements of the Contract Documents shall be removed and correctly applied or repaired by the Contractor.
- .2 In cases where the paint is "tracked" by vehicles tires, the lines may be repaired by reapplying paint and glass beads to the damaged areas.
- .3 In cases where incorrectly painted lines need to be removed, the Contractor shall use methods and equipment that will totally eliminate the pattern of the lines without damaging the integrity of the pavement surface. The methods and equipment used for such work shall be reviewed and accepted by the Departmental Representative prior to their use. Obliterating incorrectly painted lines through the sole use of paint, liquid asphalt, slurry seal or other similar materials will not be permitted.

### **3.8 QUALITY CONTROL**

- .1 In accordance with Section 01 45 00 – Quality Control.
- .2 The Contractor is responsible for quality control inspection throughout every stage of the Work to ensure that materials and workmanship comply with the requirements of the Contract Documents.
- .3 The Contractor to include in the Quality Control Plan actions to address all the elements that affect the quality of the line painting including, but not limited to:
  - .1 Paint Application Rates.
  - .2 Glass Bead Application Rates.
  - .3 Pavement Surface and Atmospheric Conditions.
  - .4 Line Widths, Line Lengths and Space Lengths.

### **3.9 HIGHWAY OPERATION**

- .1 Highway operation shall be in accordance with the Contractor's accepted Traffic Management Plan and shall meet the following requirements:
  - .1 General
    - .1 Painting shall be carried out in accordance with Section 01 14 00 - Work Restrictions and Section 01 35 31 - Special Procedures for Traffic Control.
    - .2 Operation of the painting truck against the flow of traffic will not be permitted.

- .3 Loading glass beads or paint onto the painting truck is not permitted on a roadway surface.
- .1 Operation of Companion Vehicles
  - .1 When the roadway to be painted is open to public traffic, the Contractor shall operate a crash attenuator vehicle and a pilot vehicle in conjunction with the painting truck during the painting of all longitudinal lines. Companion vehicle operators shall not attempt to control traffic from inside the vehicle.
  - .2 The actual operating parameters of the companion vehicles will be determined by the Contractor to safely accommodate traffic and will be based on site specific conditions such as sight distances, highway geometrics and traffic patterns and volumes. Typical operating parameters are as follows:
    - .1 The crash attenuator vehicle shall be equipped with a crash attenuator that meets National Cooperative Highway Research Program, Report 350 Test Criterion. Test Level 3 for 100 km/hr. The vehicle shall follow behind the painting truck at a distance of 50 to 400 m.
    - .2 The pilot vehicle shall be driven in the same travel lane as the paint machine, following it at a constant distance of approximately two kilometres.
    - .3 The crash attenuator vehicle, pilot truck and the painting truck are to display the same message at all times. The painting truck and the companion vehicles shall be equipped with a two-way radio for communication and overhead revolving beacon with an amber lens of a minimum 180 mm high and 180 mm wide.

### **3.10 PROTECTION OF COMPLETED WORK**

- .1 Protect pavement markings until dry.

### **3.11 RUMBLE STRIPS**

- .1 If applicable, centre line paint layout shall be completed prior to centre line rumble strip installation. No additional payment will be made for repainting of centre line paint following rumble strip installation.
- .2 If applicable, shoulder line painting to be completed prior to shoulder rumble strip installation.

**END OF SECTION**

## 32 17 31 GUIDE POSTS

### Part 1 General

#### 1.1 DESCRIPTION

- .1 Removal and disposal and supply and installation of Guide Posts as required to complete the Work as specified in the Contract Documents and as directed by the Departmental Representative.

#### 1.2 REFERENCES

- .1 AT - Standard Specifications for Highway Construction (latest edition)
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.28-98, Exterior Alkyd House Paint.

#### 1.3 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Measure for payment for supply and installation of plastic Guide Posts will be based on each post installed according to the Contract Documents and as accepted by the Departmental Representative.
  - .1 Payment will be made under “**Unit Price Item 8 – Supply and Installation of Guide Posts**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .2 Items considered incidental to the Work include, but are not limited to:
  - .1 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
  - .2 Removal, disposal and/or storage of existing guide posts being replaced.
- .3 Mobilization and demobilization required for this Work shall be incidental to “**Lump Sum Price Item 1 – Mobilization / Demobilization**”, and no additional payment will be made.
- .4 Traffic Control required for this Work shall be incidental to “**Lump Sum Price Item 2 – Traffic Accommodation**” and no separate payment will be made to the Contractor.

#### 1.4 SUBMITTALS

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

#### 1.5 QUALITY CONTROL

- .1 In accordance with Section 01 45 00 – Quality Control.
- .2 Notify Departmental Representative at least 4 weeks prior to installation of proposed source of guide posts and provide access for inspection.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Stockpile guide posts as recommended by the Supplier.

- .2 If required, stockpile guide posts at location determined by the Departmental Representative.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 In accordance with Section 01 35 43 – Environmental Procedures.

## **Part 2 Materials**

### **2.1 ROUND PLASTIC POSTS**

- .1 The flexible guide posts shall return to upright positions following repeated impacts and passages of vehicles over them. Such collisions shall not cause serious damage to the post or vehicle. Failure to conform to the requirements specified herein shall be cause for rejection.
- .2 General
  - .1 The posts shall be of uniform quality and workmanship and be free from defects.
  - .1 The Contractor shall provide a complete report of the physical properties of the post to the Departmental Representative. This report shall include properties such as low temperature impact resistance, after-impact recoverability and weather resistance.
- .3 Specifications - Dimensions, Colour and Construction
  - .1 The round posts shall have a minimum outer diameter of 90 mm and on overall length of 1.67 metres.
  - .2 The top 250 mm of the post length shall be black and the remainder shall be white.
  - .3 The post shall be straight. Straight is defined as having no point along the length of the post any more than 6 mm removed from a perfectly straight edge placed parallel to any side of the post.
  - .4 Round posts shall be open at the top and bottom.
  - .5 The surface of the post shall be smooth and free from irregularities or defects. The surface of the post shall not be affected by cleaning using scrapers, detergent and water, or solvent.
  - .6 The black portion of the post shall accept and hold securely high-intensity reflectorized sheeting applied to its surface area with heavy-duty stainless steel staples, glue or other adhesives deemed suitable by the manufacturer.
  - .7 If one piece construction is not used, then the connections between the pieces shall be at least as strong as if constructed of a single piece. The strength shall exist at temperatures ranging from -50°C to 50°C.
  - .8 The reflective portion of round posts shall be visible from all directions and shall be of sufficient size so as to be recognizable in the dark as a guide post reflector. The reflective portion of semi-flat posts shall be visible to traffic.
- .4 Weather Resistance and Durability
  - .1 The post shall not be seriously affected by ozone, exhaust fumes, asphalt or road oils, dirt, vegetation, deicing salts or any other types of air contamination or materials likely to be encountered after installation.



- .2 The post shall withstand without serious damage all elements likely to be encountered after installation including hot (50°C) or cold (-50°C) temperatures, rain, snow, hail, abrasion and physical abuse.
- .5 Strength and Flexibility
  - .1 The posts shall resist, without breaking, tearing, shattering or other serious damage, one highway vehicle impact at a speed of 100 km/h at a test temperature of -33°C.
  - .2 The post shall not bend, warp or distort when installed at temperatures up to 50°C or installed in wind velocities up to 120 km/h.
- .6 High-Intensity Reflectorized Sheeting
  - .1 Each post shall have a 50 mm wide reflective sheeting material fastened between 100 mm and 150 mm from the top of the post. The reflective sheeting shall be green when the Guide Post is used to mark the edges of approaches located on curves, and white in all other instances. When green is required, white sheeting shall be screen printed green using a process recommended by the sheeting manufacturer.
  - .2 The reflective sheeting material shall be high-intensity encapsulated glass bead reflective sheeting meeting or exceeding the minimum requirements as specified in ASTM-D4956, performance requirement Type III and Class I pressure sensitive adhesive backing requirements.

### **Part 3 Execution**

#### **3.1 INSTALLATION**

- .1 Install posts to details as straight and plumb vertically to a uniform depth of 0.6 m below finished grade.
- .2 Excavate post holes to minimum diameter of 150 mm and compact bottom of hole to provide firm foundation. Set post plumb and backfill with competent material in 150 mm layers. Compact each layer before placing succeeding layer.
- .3 Remove existing posts. Non-damaged posts to be stored at locations directed by the Departmental Representative.

**END OF SECTION**

## 32 91 19 TOPSOIL PLACEMENT AND GRADING

### Part 1 General

#### 1.1 DESCRIPTION

- .1 Topsoil to be native organic soils stripped and from the Contract Work area and placed on finished slopes from stockpile(s) as directed by the Departmental Representative.

#### 1.2 REFERENCES

- .1 Agriculture and Agri-Food Canada
  - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
  - .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.
- .5 AT Standard Specifications for Highway Construction (latest edition)

#### 1.3 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Measure for payment for topsoil placement and finishing will be in cubic metres measured in its original position (from stockpiles) acceptably installed within the areas indicated in the Contract Documents or as approved by the Departmental Representative.
- .2 Payment for topsoil placement will be made under **“Unit Price Item 9a – Placement of Topsoil on Finished Slopes – Stripping Placement & Topsoil”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .3 Items considered incidental to the Work include, but are not limited to:
  - .2 Preparing the finished grade.
  - .3 Loading and hauling from stockpiles.
  - .4 Placing and fine grading.
  - .5 Preparing the topsoil materials for planting.
  - .6 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
- .4 Stockpiles will be measured by Departmental Representative and volume of topsoil removed calculated by surface to surface prismatic method.
- .5 Payment for testing of topsoil to be paid under **“Lump Sum Price Item 3 - Prime Cost Sum”**.

- .6 Payment for supply and application of soil amendments will be paid under **“Lump Sum Price Item 3 – Prime Cost Sum”**.
- .7 Traffic Control shall be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”** and no additional payment will be made.
- .8 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 Mobilization/ Demobilization”** and no additional payment will be made.

## 1.4 DEFINITIONS

- .1 Compost:
  - .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
  - .2 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

## 1.5 SUBMITTALS

- .1 In accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit erosion and sedimentation control plan for Credit SSp1 in accordance with LEED Canada-NC.
- .3 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties.

## 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 In accordance with Section 01 35 43 – Environmental Procedures.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site, outside of the Parks, as approved by Departmental Representative.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

## Part 2 Products

### 2.1 TOPSOIL

- .1 Topsoil for seeded areas and planting beds: mixture of particulates, microorganisms and organic matter that provides suitable medium for supporting intended plant growth.
  - .1 Native topsoil to be stripped from on-site sources.
  - .2 Contain no toxic elements or growth inhibiting materials.
  - .3 Finished surface free from:
    - .1 Debris and stones over 100 mm diameter.
    - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

### 2.2 QUALITY CONTROL

- .1 In accordance with Section 01 45 00 – Quality Control.

- .2 Advise Departmental Representative of sources of topsoil and manufactured topsoil to be utilized with sufficient lead time for testing.
- .3 Contractor is responsible for amendments to supply topsoil as specified.
- .4 Soil testing by recognized testing facility for PH, P and K, and organic matter.
- .5 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative.
- .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

### **Part 3 Execution**

#### **3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 In accordance Section 01 35 43 – Environmental Procedures
- .2 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of sediment and erosion control drawings, sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .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 PREPARATION OF EXISTING GRADE**

- .1 Verify that grades are correct.
  - .1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
  - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
  - .2 Remove debris that protrudes more than 75mm above surface.
  - .3 Dispose of removed material off site.
- .4 Cultivate entire area that is to receive topsoil to minimum depth of 100 mm.
  - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

#### **3.3 SCREENING OF STRIPPING MATERIAL**

- .1 Contractor to screen stripping material to 50 mm max size prior to placement in stockpile. Load, haul and place screen waste material in the designated area, as directed by the Departmental Representative.

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

- .1 Place topsoil after Departmental Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 100 mm.
- .3 Spread topsoil as indicated to following minimum depths after settlement.
  - .1 100 mm for seeded areas.
  - .2 600 mm for shrub beds.
- .4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

### **3.5 FINISH GRADING**

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
- .2 Prepare loose friable bed by means of cultivation and subsequent raking.
- .3 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative.
- .4 Leave surfaces smooth, uniform and firm against deep footprinting.

### **3.6 ACCEPTANCE**

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

### **3.7 SURPLUS MATERIAL**

- .1 Topsoil not required is to be stockpiled at locations as directed by Departmental Representative.

**END OF SECTION**

## 32 92 22 HYDRAULIC SEEDING

### Part 1 General

#### 1.1 DESCRIPTION

- .1 Supply and application of Hydraulic Seeding as required to complete the work in accordance with the Contract Documents and as directed by the Departmental Representative.

#### 1.2 MEASUREMENT AND PAYMENT PROCEDURES

- .1 Measure for payment for Hydraulic Seeding will be by the hectare acceptably installed resulting in full grass growth, 75% germination and growth of specified seed mixture, within the dimensions indicated in the Contract Documents or as approved by the Departmental Representative.
- .2 Payment for hydraulic seeding shall be made under “**Unit Price Item 10 – Hydraulic Seeding**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .3 Items considered incidental to the Work include, but are not limited to:
  - .1 Areas of blending into existing landscape will not be measured for payment.
  - .2 Maintenance.
  - .3 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
- .4 Mobilization and demobilization required for this Work shall be incidental to “**Lump Sum Price Item 1 – Mobilization / Demobilization**”, and no additional payment will be made.
- .5 Traffic Control required for this Work shall be incidental to “**Lump Sum Price Item 2 – Traffic Accommodation**” and no separate payment will be made to the Contractor.

#### 1.3 SUBMITTALS

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

## **1.4 QUALITY CONTROL**

- .1 In accordance with Section 01 45 00 – Quality Control.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties to be provided to the Departmental Representative.

## **1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 In accordance with Section 01 35 43 - Environmental Procedures.

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

- .1 Use all means necessary to protect all materials before, during and after installation. Provide adequate protection to materials that may deteriorate if exposed to weather.
- .2 Seed to be stored in dry weatherproof place and shall be protected from damage by heat, rodents and other causes. Deliver and store grass seed in original packages with label indicating:
  - .1 Analysis of seed mixture;
  - .2 Percentage of pure seed by weight;
  - .3 Year of production;
  - .4 Net mass, and
  - .5 Date tagged and location.

## **Part 2 Products**

### **2.1 SEED**

- .1 Seed shall be Certified Canada No. 1 Grade quality seed varieties, in accordance with the Canadian Seeds Act and Regulations, and having a minimum purity of 97% and germination of 75%. Seed shall be free of impurities and disease.
- .2 Seed mix for all applications to be the following, by weight:
  - .1 For montane and subalpine applications:
    - 20% Adanac Slender Wheatgrass (Awned Slender Wheatgrass accepted)
    - 20% Fringed Bromegrass
    - 20% Nortran Tufted Hairgrass
    - 10% ARC Mountain Junegrass
    - 15% ARC Glacier Alpine Bluegrass
    - 15% ARC Sentinel Spike Trisetum
  - .2 For other applications:
    - 35% Nortran Tufted Hairgrass
    - 30% ARC Mountain Junegrass (if accepted by Departmental Representative)
    - 35% ARC Glacier Alpine Bluegrass
- .3 Seeding rate to be 100 kg/ha for hydraulic seeding.
- .4 **Seed certificate to be approved by the PCA ESO prior to ordering.**
- .5 Seed mix shall be free of Scentless Chamomile, Downy Brome and Canada Thistle.



## **2.2 WATER**

- .1 In accordance Section 01 35 43 – Environmental Procedures

## **2.3 SOIL STABILIZER/TACKIFIER**

- .1 Soil stabilizer/tackifier shall be a nontoxic, colourless copolymer emulsion with no less than 52.6% solids. Acceptable product is: Soil Master WR or approved alternate.

## **2.4 MULCH**

- .1 Wood fibre mulch shall be manufactured from virgin wood fibres and contain not less than 3% of an organic tackifier by volume. Cellulose type products are not acceptable. Acceptable product is: Eco Fibre Plus or approved alternate.

# **Part 3 Execution**

## **3.1 GENERAL**

- .1 No mechanical seeding will be allowed for this project.
- .2 Contractor shall advise Departmental Representative prior to the start of seeding operations.
- .3 Contractor shall mechanically remove any weeds prior to seeding. Weed removal method to be approved by Departmental Representative prior to commencement. This will be incidental to the work.
- .4 Contractor shall ensure that equipment is steam cleaned, free of soil and seed from previous project to prevent site contamination.
- .5 Seeding shall be done upon completion of stripped soil material/chip compost placement.
- .6 Contractor shall not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil, or soil covered with snow, ice or standing water.
- .7 Contractor shall hydraulic seed only during dry weather conditions with no rain forecasted for the next 24 hours and ensuring a seasonably dry seedbed to provide for proper curing of soil stabilizers/tackifier. Contractor shall check weather conditions to ensure soil stabilizer has sufficient time to cure prior to heavy rainfall.
- .8 Seeding shall be done to ensure a catch satisfactory to the Departmental Representative's approval. In areas where seed fails to germinate for whatever reason, the Contractor shall re-cultivate and reseed until acceptable germination takes place.
- .9 Contractor shall carry out seeding in locations as per the Contract Documents or, as directed by Departmental Representative.

## **3.2 HYDRAULIC SEEDING**

- .1 The following application rates are the minimum required for hydraulic seeding:
  - .1 Seed: 100 kg/hectare
  - .2 Mulch: 1500 kg/hectare
  - .3 Tackifier: As per Manufacturer's Instructions
  - .4 Water: 30,000 L/hectare

- .2 The Contractor shall measure quantities of materials by weight, or weight calibrated Contractor to calculate and submit applicable area of coverage per tank load of slurry in accordance with Section 01 33 00 – Submittal Procedures
- .3 Contractor shall physically stake and identify limits of tank coverage prior to seeding to the satisfaction of Departmental Representative.
- .4 Each tank load of slurry shall be fully applied within the designated boundaries for each load as staked volume measurement, to the satisfaction of the Departmental Representative.
- .5 The Contractor shall fill the tank half full with required water and add mulch while continuing to fill with water. Seed mix and fertilizer is to be added. All material is to be added into the hydraulic seeder under agitation. The Contractor shall pulverize mulch with tackifier and charge slowly into seeder.
- .6 The Contractor shall charge soil stabilizer/tackifier into seeder after all other material is well mixed in seeder. Contractor shall mix slowly to avoid foaming but thoroughly to complete slurry.
- .7 The Contractor shall use hydraulic seeding equipment with a minimum slurry tank capacity of 4500 litres.
- .8 The Contractor's equipment shall have an agitation system for slurry capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and mechanical method:
  - .1 Pumps shall be capable of maintaining a continuous non-fluctuating flow of solution.
  - .2 Equipment shall be capable of seeding up to 150m distance from hydraulic seeder using hand operated hoses and appropriate nozzles.
- .9 The Contractor shall apply slurry when wind velocities will not affect the application and cause the mixture to be blown.
- .10 The Contractor shall apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed. Ensure good contact of slurry with soil with minimal air pockets.
- .11 The Contractor shall use the correct nozzle(s) for application and use hoses to access difficult to reach surfaces and to control application.
- .12 The Contractor shall ensure that the application is uniform and the surface is evenly covered. Contractor shall blend into retained landscape for approximately 1 metre.
- .13 The Contractor shall clean all structures, appurtenances and natural features not designated to be seeded of any overspray, to the satisfaction of the Departmental Representative.
- .14 The Contractor shall ensure that at all times during the seeding, that no vehicles are parked within the path of public travel and the Contractor shall provide warning devices as directed by the Departmental Representative to ensure safe operations.
- .15 Traffic Control to be in accordance with Section 01 35 31 – Special Procedures for Traffic Control.

### 3.3 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Establishment period is a minimum of four months of continuous growing season. Growing season shall not to be divided by winter.

- .2 The Contractor shall repair and reseed dead or bare spots, as directed in the Contract Documents, to Departmental Representative's satisfaction, to allow establishment of seed prior to acceptance. In the case of erosion, the Contractor shall be compensated at the specified unit rates for reseeding.
- .3 For areas of poor seed germination and growth, as determined by the Departmental Representative, the soil shall be scarified or re-cultivated as directed by the Departmental Representative, and seeding and fertilizing undertaken as specified. This work is incidental to the Contract.

### **3.4 CONSTRUCTION COMPLETION ACCEPTANCE**

- .1 Seeded areas will be accepted by the Departmental Representative provided that all areas are uniformly established and turf is not eroded or rutted and relatively free of weeds. Seeded areas to be growing for a minimum of four continuous months prior to construction completion acceptance inspection.
- .2 Areas seeded in fall will be accepted in following spring, a minimum of four months after start of growing season, provided acceptance conditions are fulfilled.
- .3 Minimum 75% growth by area of coverage of specified seed mixture must be present in order to be acceptable.

### **3.5 MAINTENANCE DURING WARRANTY PERIOD**

- .1 Maintenance shall occur for one full year from Construction Completion Acceptance. The estimated period of maintenance within one calendar year shall be from approximately April 1 to October 31. The Contractor will be required to employ all of the necessary measures to establish and maintain all seeding in an acceptable, vigorous and healthy growing condition.
- .2 The Contractor shall repair and reseed dead or bare spots, as directed in the Contract Documents, to Departmental Representative's satisfaction, to allow establishment of seed prior to acceptance. In the case of erosion, the Contractor shall be compensated at the specified unit rates for reseeding.
- .3 For areas of poor seed germination, or as determined by the Departmental Representative, the soil shall be scarified or re-cultivated as directed by the Departmental Representative, and seeding and fertilizing undertaken as specified. This work is incidental to the Contract.
- .4 For small areas of poor seed germination or as determined by the Departmental Representative, the soil shall be scarified to a depth of 25 mm and seeding and fertilizing shall be undertaken as specified. This work is incidental to the Contract.
- .5 Weed control shall be undertaken as determined by the Departmental Representative. Hand pulling of weeds may be required. This work is incidental to the Contract.

### **END OF SECTION**

## 33 42 13 PIPE CULVERTS

### Part 1 General

#### 1.1 DESCRIPTION

- .1 Removal and disposal and supply and installation of Corrugated Steel Pipe (CSP) culverts as required to complete the work in accordance with the Contract Documents and as directed by the Departmental Representative.

#### 1.2 REFERENCES

- .1 AT - Standard Specifications for Highway Construction Manual (latest edition)
- .2 CSA-G401, Corrugated Steel Pipe Products.
- .3 CSA-B182.8, Profile Polyethylene Storm Sewer and Drainage Pipe and Fittings.

#### 1.3 MEASUREMENT AND PAYMENT

- .1 Remove and Dispose of Corrugated Steel Pipe (CSP) culverts:
  - .1 Removal and Disposal of CSP culverts will be measured for payment in linear metres of the types and sizes removed and disposed of outside of the National Parks, regardless of the culvert depth in accordance with the Contract Documents and accepted by the Departmental Representative..
  - .2 Payment will be made under “**Lump Sum Price Item 3 – Prime Cost Sum**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .2 Supply and Installation of CSP Culvert Extensions
  - .1 Supply and Installation of CSP culvert extensions will be measured for payment in linear metres of the types and sizes supplied, assembled, installed in accordance with the Contract Documents and accepted by the Departmental Representative.
  - .2 Payment will be made under “**Unit Price Item 9 – Pipe Culverts – Supply & Install 600mm dia CSP Extension**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
  - .3 Payment will be made under “**Unit Price Item 9 – Pipe Culverts – Supply & Install 900mm dia CSP Extension**” and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
  - .4 At locations of extensions to existing culverts, thoroughly cleaning and flushing the existing culvert ends and barrel, excavating up to 2m from present exposed end or as directed by the Departmental Representative, cutting off damaged sections of exposed end and painting remaining end with a high zinc dust oxide paint and supplying and placing a joint sealant shall be considered incidental to “**Unit Price Item 9 – Pipe Culverts – Supply and Install CSP Culvert**”

**Extensions”** and shall include all incidentals, equipment, labour and materials required to complete the Work.

- .3 Supply and Installation of CSP Culverts
  - .1 Supply and Installation of CSP culverts will be measured for payment in linear metres of the types and sizes supplied, assembled, installed in accordance with the Contract Documents and accepted by the Departmental Representative, regardless of the culvert depth.
  - .2 Payment will be made under **“Unit Price Item 9a – Pipe Culverts – Supply and Install 600mm dia CSP Culverts”** and the price(s) bid shall be full compensation for the cost of furnishing all labour, materials, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.
- .4 Items considered incidental to the Work include, but are not limited to:
  - .1 The supply of bolt-type corrugated couplers and ancillary materials.
  - .2 Excavation.
  - .3 Sawcutting.
  - .4 Asphalt removal.
  - .5 Supply, loading, hauling and unloading CSP culverts.
  - .6 Loading, hauling and disposal of unsuitable material and CSPs.
  - .7 Backfill Works, including but not limited to; supply, placement and compaction of all backfill materials.
  - .8 Supply and installation of all culvert bedding materials.
  - .9 Cutting of culvert ends to satisfaction of Departmental Representative.
  - .10 Dewatering as required to complete the Work.
  - .11 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures.
  - .12 Couplings, fittings or end sections for CSP culverts.
  - .13 Survey and layout.
  - .14 Disposing of material from cleaning culverts.
- .5 Asphalt concrete pavement will be paid under **“Unit Price Item 6 - Asphalt Concrete Pavement – EPS”** in accordance with Section 32 12 16 - Asphalt Concrete Pavement.
- .6 Mobilization and demobilization required for this Work shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”**, and no additional payment will be made.
- .7 Traffic Control during the survey, layout and Construction of the culverts shall be incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”** and no separate payment will be made to the Contractor.
- .8 Payment for plugging of existing culverts will be made under **“Lump Sum Price Item 3 - Prime Cost Sum”**.

#### 1.4 QUALITY CONTROL

- .1 In accordance with Section 01 45 00 - Quality Control.

- .2 Culvert roadway crossings with bumps and dips in the finished asphalt exceeding 12mm over 3m from the design grade will require remedial work to repair the deficiency as acceptable to the Departmental Representative. The Contractor is responsible for all costs associated with repairing bumps and dips from culvert crossings.

## **1.5 SUBMITTALS**

- .1 In accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit manufacturer's test data and certification.
- .3 Provisions for staged construction shall be shown in the shop drawings, including any temporary support required.
- .4 Certification to be marked on pipe.

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

- .1 In accordance with Section 01 61 00 - Common Product Requirements.
- .2 Handle and store pipe products in a manner to avoid damage, alteration, deterioration and soiling.
- .3 Store pipes on a clean and flat surface at location as directed by the Departmental Representative.
- .4 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.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 In accordance with Section 01 35 43 – Environmental Procedures.
- .2 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative, outside of the National Parks.
- .3 Fold up metal banding, flatten and recycle at appropriate facilities, outside of the National Parks.

## **Part 2 Products**

### **2.1 CORRUGATED STEEL PIPE**

- .1 Corrugated steel pipe: to CSA-G401.
- .2 Culverts to be annular or spiral with annular ends. Coupling bands to be two piece annular bolted with minimum width of nine corrugations.
- .3 Minimum wall thickness to be 2.0 mm.
  - .1 Or greater in accordance with manufactures recommendations in the specific installed conditions.
- .4 Corrugations to be 68 mm x 13 mm.
- .5 For all exposed culvert ends, 4:1 mitred end sections will be required.
- .6 Design Code CHBDC S6-06.

- .7 Design Live Load CL-800.

## **2.2 GRANULAR BEDDING AND BACKFILL**

- .1 AT Designation 2 Class 20 Base Course Aggregate for pipe bedding to be supplied by the Contractor from outside the Park.
- .2 AT Designation 2 Class 40 Base Course Aggregate for backfill to be supplied by the Contractor from outside the Park.

## **2.3 FLOWABLE FILL**

- .1 Culverts shown to be abandoned in the Contract Documents shall be filled with a flowable fill, as follows:
- .1 A culvert to be abandoned shall be filled with a Sulfate (Acid) Resistant concrete slurry, capped and buried within the embankment. The resulting concrete slurry-filled culvert shall be proven to be 100% free of voids. The Contractor shall provide a written procedure for filling the culverts, acceptable to the Departmental Representative.
- .2 Specifications for flowable fill:
- .1 Sufficient water to produce a self-levelling flow with a slump of 150-200mm
- .2 Cement: 30kg/m<sup>3</sup>
- .3 Fly Ash: 40kg/m<sup>3</sup>
- .4 Fine Aggregate: 1860 kg/m<sup>3</sup>
- .2 If requiring more than one concrete truck, Culvert abandonment using Flowable Fill to be completed in one day, with no time in between trucks, as acceptable to the Departmental Representative.

## **2.4 RIPRAP**

- .1 Riprap shall be installed in accordance with Section 31 37 00 – Riprap.

# **Part 3 Execution**

## **3.1 METHODOLOGY**

- .1 Contractor to verify all culvert lengths, weights, diameters and types in the field prior to ordering.
- .2 Culvert installation must be coordinated with embankment construction. No payment will be made for re-excavation of embankment material required to install culverts.
- .3 Pipe culvert works cannot commence until approved by the Departmental Representative.
- .4 Existing culverts within the construction limits, that remain in service must be thoroughly cleaned and flushed; all sediments and bedload must be removed to the satisfaction of the Departmental Representative.
- .5 If required, additional permits for pipe culvert works will be provided by Parks Canada at the request of the Contractor.



### **3.2 CUT ENDS**

- .1 All exposed ends of CSP culverts to have sloped end sections conforming to roadside slope, by cutting culvert with mechanical saw.
- .2 All cut edges shall be made smooth by grinding so that all the burrs are removed. Any damaged galvanizing shall be restored by zinc metallizing in accordance with CSA G401.
- .3 Where an existing culvert is extended, up to 2 m of the existing culvert end shall be removed as directed by the Departmental Representative.

### **3.3 BEDDING**

- .1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.
- .2 Place minimum thickness of 300 mm of approved granular material on bottom of excavation and compact to minimum 98% Standard Proctor density to ASTM D698.
- .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 Departmental Representative, free from sags or high points.
- .4 Place bedding in unfrozen condition.

### **3.4 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 Do not allow water to flow through pipes during construction except as permitted by Departmental Representative.

### **3.5 JOINTS: CORRUGATED STEEL CULVERTS**

- .1 Match corrugations of coupler with pipe sections before tightening.
- .2 Insert and tighten bolts.
- .3 Tap couplers firmly with a rubber mallet or similar non-marring tool as they are being tightened, to take up slack and ensure snug fit.
- .4 Repair spots where damage has occurred to coating in the field by applying two coats of zinc rich paint approved by the CSP supplier. Allow each coat to dry before placing second coat, bedding or backfill.

### **3.6 BACKFILLING**

- .1 Backfill around and over culverts as indicated in the Contract Documents or as directed by Departmental Representative.
- .2 Place granular backfill material, 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% Standard Proctor density to ASTM D698 taking special care to obtain required density under haunches. Hand tamp where necessary to obtain compaction.

- .4 Protect installed culvert with minimum 900 mm cover of compacted fill before heavy equipment is permitted to cross. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 2H:1V.
- .5 Place backfill in unfrozen condition.
- .6 Place Riprap in accordance with Section 31 37 00 – Riprap.

### **3.7 CULVERT END TREATMENTS**

- .1 Culvert end treatments to be completed, as accepted by the Departmental Representative, prior to removing water diversions. Any scour resulting from incomplete end treatments is to be repaired by the Contractor at their cost.

### **3.8 TRENCHING EXISTING PAVEMENT STRUCTURES**

- .1 Where trenches are cut into existing pavement structures, backfill will match the existing materials and thickness.

### **3.9 CLEANING OF CULVERTS**

- .1 Remove and dispose of material from the culvert barrels and/or ends to restore proper drainage, as directed by the Departmental Representative.
- .2 Removed material to be disposed of outside of the Parks.

### **3.10 CULVERT EXTENSIONS**

- .1 Extensions to existing culverts shall be as noted in the Contract Documents.

### **3.11 CULVERT / STRUCTURE REMOVAL**

- .1 Culvert removal shall be as indicated in the Contract Documents and shall include disposal of sections to a suitable disposal facility outside of the National Parks.

### **3.12 STREAM AND CHANNEL DIVERSIONS**

- .1 Temporary stream and channel diversions shall be in accordance with Section 01 35 43 – Environmental Procedures.

### **END OF SECTION**