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Drawings:	001 Overview Map <del>002 Remote Avalanche Control Targets</del> 002 Remote Avalanche Control Targets Rev 01
KMZ Files:	Avalanche Paths Remote Avalanche Control Targets* Staging Area
Photos:	Photo 1 – Slide Path #3 Remote Avalanche Control Targets Photo 2 – Slide Path #4 Remote Avalanche Control Targets Photo 3 – Slide Path #5 Remote Avalanche Control Targets
Reference Documents:	Golder Basic Impact Analysis (BIA) August 2016 Golder Geotechnical Assessment, August 2016
Appendix B:	Bosworth Lower Weather Data Bosworth Upper Weather Data Bow Summit Weather Data

\*Please note that the Google Earth imagery for Mount Bosworth is not georeferenced correctly. As such, the targets in this kmz file appear to be in the wrong locations if opened in Google Earth. Proponents are encouraged to use any GIS software (e.g. ArcGIS, QGIS, etc.) that can load online imagery, and to ensure that said imagery is correctly georeferenced.

**Part 1 General****1.1 PRECEDENCE**

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

**1.2 DEFINITIONS**

- .1 “YNP”, “The Park” or “Yoho NP” shall refer to Yoho National Park of Canada.
- .2 “TCH” shall refer to the Trans-Canada Highway 1.
- .3 Any reference to “Parks Canada Agency”, “Parks Canada”, “PCA” or “The Owner”, shall refer to Parks Canada Agency and shall include any affiliate or sub group of Parks Canada Agency.
- .4 British Columbia Ministry of Transportation and Infrastructure is referred to as “BC MoTI”.
  - .1 Standard Specifications are available:  
[http://www.th.gov.bc.ca/publications/const\\_maint/contract\\_serv/standardspecs.htm](http://www.th.gov.bc.ca/publications/const_maint/contract_serv/standardspecs.htm)
- .5 Changes in Definition, - The following changes in definitions have been made to the Specifications above:
  - .1 Consultant – The word “Consultant” shall mean Departmental Representative or his duly appointed representative.
  - .2 Department – The word “Department” shall mean Parks Canada Agency.
- .6 “ERD” shall mean Explosives Regulatory Division.
- .7 “Public Road or Highway” shall mean any road, street or highway under the jurisdiction of and maintained by a public authority and open to public travel.
- .8 “Public Facility” shall mean any works, buildings or properties owned, leased or rented by a public agency.
- .9 “RACS” shall mean a Remote Avalanche Control System.
- .10 “Operational Deployment Site” shall mean the final installed location of each RACS in its designated location, as outlined in this Contract and approved by the Departmental Representative.
- .11 “Banff Warden Office” shall mean the administration building located at 216 Hawk Avenue, Banff, Alberta.
- .12 “Slate Road Office” shall mean the McElhanney field office located just off the TCH on the NE side, ~1km NW of the Lake Louise car overpass.
- .13 “PCA Lake Louise Operations Centre” shall mean the PCA building located on Sheol Road in Lake Louise.
- .14 “ANFO” shall mean Ammonia Nitrate Fuel Oil.

**1.3 RELATED SECTIONS**

- .1 Section 01 29 01 - Site Occupancy.

- .2 Section 01 33 00 - Submittal Procedures.

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

- .1 In preparation for and during construction of this project, the Contractor shall review the requirements of Section 01 35 43 – Environmental Procedures to ensure the desired minimal adverse effects are achieved. The Departmental Representative and Parks Canada’s environmental surveillance officer (ESO) will refer to Section 01 35 43 – Environmental Procedures in determining compliance.
- .2 The project work consists of:
- .1 The design, supply, storage and installation of a number of Remote Avalanche Control Systems at locations identified in the contract documents; number of RACS required at each location to be determined by individual suppliers based on performance criteria outlined in the contract documents.
  - .3 Major scope items include: excavation, rock bolting, rock scaling, drilling, forming and pouring reinforced concrete foundations, equipment supply and installation.
  - .4 Without limiting the scope of work, the work of this Contract generally comprises the following:
    - .1 “Design and build” RACS at locations shown on the Drawings or as directed by the Departmental Representative.
    - .2 Preparation of engineered drawings for all foundations.
    - .3 Supply, transportation and storage in an owner supplied location, subject to approval by the Departmental Representative, of all related and required devices, materials and controls prior to the interim completion date;
    - .4 Transportation and installation of devices, materials and controls following the interim completion date and before the final completion date.
    - .5 The preparation of a plan (including a Health and Safety Review), and perform a detailed ground survey for unexploded ordnances using a trained technician with a metal detector or equivalent detector system approved by the Departmental Representative.
    - .6 A 1 year warranty (minimum) following the Construction Completion Date.
    - .7 Construction of foundations (either reinforced concrete or bolted to native rock using the method most appropriate to the geological conditions found at the sites) including all site work (including, but not limited to: excavation, rock scaling, rock bolting, and grounding for lightning protection).
    - .8 Installation of all avalanche control system equipment.
    - .9 Testing and commissioning to bring the systems into fully functional states to the satisfaction of PCA.
    - .10 Training of PCA staff.
    - .11 Supply and installation of traffic control and other temporary construction facilities required for completion of the Work of the Project, including during testing and commissioning.
    - .12 Miscellaneous Additional Work as directed by the Departmental Representative.

- .13 Where specifications for work covered under this Contract, including any Change Orders, are not available, BC MoTI – 2012 Standard Specifications for Highway Construction shall apply unless otherwise directed by the Departmental Representative.

## **1.5 PROJECT LOCATION**

- .1 The project is located in Yoho National Park British Columbia as shown in Drawing 001. The following are key locations relative to the project:
  - .1 TCH HWY km 82 – East boundary YNP
  - .2 TCH HWY km 83.5 to km 84.5 – Highway affected by Mount Bosworth slide paths #3, #4 & #5.
  - .3 TCH HWY km 128 – West boundary YNP

## **1.6 CONTRACT METHOD**

- .1 The Contractor shall construct the Work under combined price contract.

## **1.7 WORK BY OTHERS**

- .1 The Contractor is advised that the following Work in the vicinity has been or will be contracted by Parks Canada:
  - .1 Line painting at various locations. Contractor is to be determined. Anticipated contract completion Fall 2017.
  - .2 It is anticipated that a contractor will be widening the TCH from approximately km82.5 to 88 from Fall 2016 to Fall 2017.
  - .3 It is anticipated that contractors will be undertaking rock blasting and slope stabilization works at various locations along the TCH in YNP. Anticipated contract completion is Fall 2017.
  - .4 Other maintenance and project work may occur along the TCH in 2016 and 2017.
- .2 The Contractor shall coordinate work of this contract with the work done by other contractors on or near the work area as required.
- .3 No claims for any delays or inconvenience will be entertained.

## **1.8 WORK SEQUENCE**

- .1 Schedule work progress to allow Owner/Departmental Representative unrestricted access to inspect all phases of the Work.
- .2 The Contractor shall maintain fire and emergency access / egress at all times.
- .3 The Contractor shall prepare a meaningful bar chart or network diagram showing the proposed schedules of major work that shall be submitted to the Departmental Representative one (1) week prior to commencement of any work.
  - .1 **Interim Completion (Design, Supply and Storage) by February 28, 2017;**  
(Interim Completion shall not be interpreted as Substantial Performance)
  - .2 **Complete all work by September 30, 2017 (Contract Completion Date).**

- .3 Demobilize from site if at any time, the relevant area is declared to be at risk of being impacted by an avalanche.

- .1 Although no guarantee is provided as to when this may occur, in the past it has been late September.

## **1.9 CONTRACTOR USE OF PREMISES**

- .1 Contractor has unrestricted use of site, subject to Section 01 14 00 and Section 01 29 01, until Contract Completion date.
- .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 with the acceptance of the Departmental Representative.
- .4 Obtain additional storage or work areas needed for operations under this Contract with the acceptance of the Departmental Representative.
- .5 The Contractor will be allowed up to two (2) RVs for security at the laydown or other locations as approved by the Departmental Representative and Parks Canada ESO provided that they also obtain a Restricted Access Permit prior to mobilization of the RVs.
- .6 The Contractor and each sub-contractor shall purchase a business license from the Parks Canada office in Lake Louise Visitor Information Centre, prior to commencement of the Contract Works.
- .7 All Contractor's business and private vehicles are required to display a vehicle work pass from Parks Canada. These permits may be obtained free of charge from Parks Canada Environmental Surveillance Officer or as directed by the Departmental Representative.

## **1.10 OWNER FURNISHED ITEMS**

- .1 Not used

## **1.11 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.

## **1.12 CONSTRUCTION SIGNAGE**

- .1 No signs or advertisements, other than warning signs, are permitted on site.
- .2 Signs and notices for safety and instruction shall be in both official languages. Signs shall be diamond grade and shall conform to CAN3-Z321.
- .3 The Contractor shall maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by the Departmental Representative.

- .4 **All temporary traffic control signs that are used for longer than one day shall be mounted on wood posts other than portable changeable message boards that shall be secured at all times.**
- .5 Signage shall be coordinated with other Contractors.

**1.13 SETTING OUT OF WORK**

- .1 Contractor shall:
  - .1 Set survey control points as necessary to complete the work.
  - .2 Set all work stakes necessary to complete the work.
  - .3 Allow sufficient time for the Departmental Representative to take measurements for payment.
  - .4 Not damage geodetic benchmarks or control monuments unless authorized by the Departmental Representative.
- .2 No separate payment for setting out work, unless the Departmental Representative adjusts alignment in field and additional survey costs are incurred. Payment for additional survey required due to changes by Departmental Representative to be paid for as part of the Prime Cost Sum.

**Part 2 Products**

- .1 Not used.

**Part 3 Execution**

- .1 Not used.

**END OF SECTION**

**Part 1 General****1.1 PRECEDENCE**

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

**1.2 RELATED SECTIONS**

- .1 Section 01 32 16.07– Construction Progress Schedules – Bar (Gantt) Chart.
- .2 Section 01 35 00.06– Special Procedures for Traffic Control.
- .3 Section 01 35 43 – Environmental Procedures.

**1.3 EXISTING SERVICES**

- .1 The Contractor shall maintain pedestrian and vehicular traffic for the duration of the construction.

**1.4 USE OF THE WORK SITE AND FACILITIES**

- .1 The Work Site 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.
- .2 Contractor will not be permitted to establish a construction camp within the National Parks. Parks Canada regulations prohibit anyone working within the Park from using public campground facilities.
- .3 Office-tool trailer may be set up at the Staging Area or other location as directed by the Departmental Representative. See Section 01 35 43 – Environmental Procedures.
- .4 Contractor shall maintain adequate drainage at the Work Site and Staging Area.
- .5 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 his cost for the performance and inspection of the Work.
- .6 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep area and premises in sanitary condition.
- .7 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at its expense.
- .8 The Contractor may work subject to the following restrictions:
  - .1 No hauling of material during inclement weather.
  - .2 **Work in Yoho National Park is permitted during daylight hours only, and from 07:00am to 10:00pm, 6 days a week. No work shall disrupt the travelled lanes on Trans-Canada Highway during the months of July and August. No work shall be permitted to occur on Sundays.**



**.3 The Contractor will not be permitted to work on the following Civic Holidays or long weekends unless prior written approval is granted by the Departmental Representative:**

- .1 Labour Day long weekend: From 19:00 Thursday, September 1, 2016 to 07:00 Tuesday, September 6, 2016.
- .2 Thanksgiving Day weekend: From 19:00 Thursday, October 6, 2016 to 07:00 Tuesday, October 11, 2016.
- .3 Canada Day: From 19:00 Thursday June 29, 2017 to 07:00 Monday, July 3, 2017.
- .4 Civic Holiday long weekend: From 19:00 Thursday, August 3, 2017 to 07:00 Tuesday, August 8, 2017.
- .5 Labour Day long weekend: From 19:00 Thursday, August 31, 2017 to 07:00 Tuesday, September 5, 2017.
- .6 Thanksgiving Day weekend: From 19:00 Thursday, October 5, 2017 to 07:00 Tuesday, October 10, 2017.

**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 Refer to Section 01 35 43 – Environmental Procedures for details.
- .4 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. One “Bear Proof” garbage container will be provided by PCA.
- .5 The Contractor is responsible for the development and supply of construction access to the Work as approved by the Departmental Representative.

**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 his operations.**
- .2 The Contractor shall establish and maintain direct and continuous contact with the owners or operators of any Utilities that 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 Contractor shall notify the Departmental Representative and the Utility companies at least seven days in advance of any activities that may interfere with the operation of such Utilities.
- .4 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.

- .5 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.
- .6 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 PROPERTY 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, 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 **Commencement of construction in any area shall be interpreted to signify that the Contractor has accepted the risk associated with unexploded ordnances, and has prepared a plan for such associated work.**
- .7 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 PROTECTION OF PERSONS AND PROPERTY

- .1 Comply with Occupational Health and Safety Act British Columbia.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.
- .3 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Sites.
- .4 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.

**1.9 USE OF PUBLIC AREAS**

- .1 Off-road construction equipment will not be allowed on the existing highway except at designated crossing points and loading areas. Steel tracked equipment with cleats will not be allowed on pavement designated for future use. 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.
- .2 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.
- .3 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.

**1.10 SUPERVISORY PERSONNEL**

- .1 Within five days after award notification, 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 The following personnel shall be included in the list:
  - .1 Project Superintendent.
  - .2 Safety Representative.
- .3 The above personnel shall perform the following duties:
  - .1 The Project Superintendent shall be employed full time and 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.
  - .2 The Project Superintendent shall nominate a Deputy Project Superintendent who shall have the authority of the Project Superintendent during the latter's absence.
  - .3 The Safety Representative shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement of Work until the Total Performance of the Work.

**1.11 MEETINGS**

- .1 The Work includes attending meetings between the Contractor and the Departmental Representative. The 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.
- .2 The Departmental Representative will schedule an initial meeting to be held on site after award notification. Senior representatives of the Owner, Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.

- .3 The Contractor will be requested to assemble his site staff and sub-contractors for an environmental briefing to be conducted by Parks Canada. The briefing shall be of approximately 2 hours in duration and held at initial project start-up. The Contractor shall ensure that all his current project staff is in attendance. The Departmental Representative and the Contractor will co-operate in setting the most appropriate time and place for the briefing. Subsequent to the initial environmental briefing, briefings will be arranged for new staff and sub-contractors showing up on the project.
- .4 Cost of attending the above meetings shall be considered incidental to the Unit Price items and no additional payment will be made.

**1.12 WASTE DISPOSAL**

- .1 All surplus, unsuitable and waste materials shall be removed from the job site by the Contractor to approved sites outside Yoho National Park, unless otherwise authorized by the Departmental Representative. Refer to Section 01 35 43 – Environmental Procedures and the Environmental Protection Plan.
- .2 Deposit of any construction debris into any waterway is strictly forbidden.
- .3 Cost for Waste Disposal described above shall be considered incidental to the Unit Price items and no additional payment will be made.
- .4 Waste Disposal shall be completed in accordance with Section 01 35 43 – Environmental Procedures.

**1.13 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.

**Part 2 Products**

- .1 Not used.

**Part 3 Execution**

- .1 Not used.

**END OF SECTION**

**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 **\$300,000.00** for items and materials listed below.
- .2 Do not include in the Contract Amount, additional contingency allowances for products, installation, overhead or profit.
- .3 Prime Cost Sum provided for in the lump sum table is not a sum due the Contractor. Rather, payment will be made against it for miscellaneous Work not included in the unit price table under the General Conditions of the Contract.
- .4 No interpretation of the work as noted below shall indicate that work will be included under the Prime Cost Sum. Items, tasks, and activities included in the Works elsewhere in the Contract shall be paid as indicated in those sections.
- .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 approved daily extra work reports as noted in Clause 1.3 below.
- .7 Such work may include, but not be limited to:
  - .1 Supply and installation of permanent signage (not construction signs);
  - .2 Additional helicopter usage;
  - .3 Additional survey;
  - .4 Additional Geotechnical Investigations or work;
  - .5 Removal and Disposal of unexploded ordnances;
  - .6 Construction of access to additional sites as directed by the Departmental Representative;
  - .7 Construction of additional permanent helipads, as directed by the Departmental Representative;
  - .8 Additional stripping, excavation and disposal of waste materials as directed by the Departmental Representative;
  - .9 Additional removal of rock, loose rock or danger trees as directed by the Departmental Representative;
  - .10 Additional rock bolting and rock scaling as directed by the Departmental Representative, not including rock bolting and scaling related to site access as described in Section 33 42 36 Clause 2.2.6.
  - .11 Additional construction of foundations including the supply of required materials as directed by the Departmental Representative;
  - .12 Supply and installation of additional RACS as directed by the Departmental Representative;
  - .13 Supply and installation of additional permanent rock fall mitigation systems as directed by the Departmental Representative

- .14 Supply of additional accessories for RACS;
- .15 Supply and use of temporary storage facilities if required as determined by the Departmental Representative;
- .16 Supply of portable changeable message boards;
- .17 Top soiling, seeding and landscaping as requested by the Departmental Representative;
- .18 Training of additional PCA Staff if requested by the Departmental Representative;
- .19 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 PROCEDURES

- .1 Payment for Work under the “**Lump Sum Price Item 3 – Prime Cost Sum**” will be made as per the following:
  - .1 Equipment rates will be in accordance with the current British Columbia Roadbuilders and Heavy Construction Association Equipment Rental Rate Guide (BC Blue Book), and will be all inclusive and fully operated.
  - .2 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.
  - .3 Equipment paid on standby will be paid on 50% of the relevant Less Operator rates to a maximum of 10hrs per day.
  - .4 When based upon actual costs for additional works under Prime Cost Sum, payment will be based upon supplied invoices and other work records.
  - .5 The Prime Contractor may apply a 10% mark-up to subcontractor or supplier invoices only when those tasks completed did not require the use of equipment covered under the BC Blue Book, as approved by the Departmental Representative.
  - .6 Where work, by sub-contractor or otherwise, is conducted by equipment covered under the BC Blue Book, no mark-up will be allowed on relevant equipment and labour rates above the BC Blue Book rate
  - .7 A claim for additional payment will not be considered submitted until all required documentation has been received by the Departmental Representative.

### Part 2 Products

- .1 Materials shall be in accordance with BC MoTI – 2012 Standard Specifications for Highway Construction, or as directed by the Departmental Representative.

### Part 3 Execution

- .1 Work shall be in accordance with BC MoTI – 2012 Standard Specifications for Highway Construction, or as directed by the Departmental Representative.

Project No. 201614

Parks Canada Agency

Trans-Canada Highway  
Avalanche Mitigations  
Mount Bosworth  
Yoho National Park

Section 01 2100  
ALLOWANCES

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**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 01 11 00 – Summary of Work

### **1.2 DESCRIPTION**

- .1 Mobilization and Demobilization consists of preparatory work and operations pertaining to the installation of RACS, 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 Design, supply and storage of RACS or other materials shall not be eligible for mobilization or demobilization payments.
- .3 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.

### **1.3 MEASUREMENT 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 for installation (after March 31, 2017) 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 Not used.

## **Part 3 Execution**

- .3 Not used.

**END OF SECTION**



## **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 RELATED SECTIONS**

- .1 SACC R2850D – GC 5.10.
- .2 Section 01 11 00 – Summary of Work Clause 1.8 - Work Sequence.

### **1.3 DEFINITION OF OCCUPANCY**

- .1 The Contractor shall be permitted to lease and occupy sites when working in Yoho National Park, free of charge from the date of award of the contract up to and including completion date of construction.
- .2 The Contractor's occupancy of the sites identified in Contract will be deemed to have ended, when both of 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 clean 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**

- .1 Not used.

## **Part 3 Execution**

- .1 Not used.

**END OF SECTION**

**Part 1 General****1.1 RELATED SECTIONS**

- .1 Section 01 11 00 – Summary of Work.
- .2 Section 01 14 00 – Work Restrictions.
- .3 Section 01 32 16.07– Construction Progress Schedules – Bar (Gantt) Chart.
- .4 Section 01 33 00 - Submittal Procedures.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 01 45 00 – Quality Control.
- .7 Section 01 52 00 – Construction Facilities.
- .8 Section 01 77 00 – Close out Procedures.
- .9 Section 01 78 00 – Close out Submittals.

**1.2 MEASUREMENT PROCEDURES**

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

**1.3 COORDINATION**

- .1 The Contractor shall 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.
- .2 The Contractor shall provide transportation for and cover the transportation costs, between the Staging Area and the work sites, for the Departmental Representative as well as any PCA staff involved in the construction phase of the project for the purpose of site inspections including testing, commissioning and training. The Departmental Representative and PCA both intend to work with the Contractor to develop efficiencies in helicopter use.

**1.4 PROJECT MEETINGS**

- .1 The Contractor shall attend project meetings throughout progress of the Work and provide information as determined by the Departmental Representative. Meetings will be chaired by the Departmental Representative who will prepare the minutes of the meetings.
- .2 The Contractor shall attend pre-installation meetings, when specified in specifications and when required to coordinate related or affected Work and provide information, as determined by the Departmental Representative.
- .3 The Contractor shall arrange physical space and make arrangements for meetings through the Departmental Representative. Meeting space at the Slate Road Office will be made available to the Contractor if not previously booked or in use by Parks Canada. Should space not be available, the Contractor shall provide an alternative location.

**1.5 CONSTRUCTION ORGANIZATION AND START-UP**

- .1 Within seven (7) days after award of Contract, the Contractor shall request a meeting of Contract Representatives to discuss and resolve administrative procedures and responsibilities. Meeting will 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 16.07.
  - .3 Schedule of submittals in accordance with Section 01 33 00.
  - .4 Requirements for temporary facilities, offices, storage sheds, utilities, fences in accordance with Section 01 52 00.
  - .5 Site safety and security in accordance with Sections 01 14 00, 01 52 00 and 01 35 43.
  - .6 Quality Control in accordance with Section 01 45 00.
  - .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 Close out procedures and submittals in accordance with Sections 01 77 00 and 01 78 00.
  - .11 Insurances and transcript of policies.
  - .12 Other business.
- .4 The Contractor shall comply with the Departmental Representative's allocation of mobilization areas of site, for field offices and sheds, and for access, traffic, and parking facilities.
- .5 During construction, the Contractor shall 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 The Contractor shall comply with instructions of the Departmental Representative for use of temporary utilities and construction facilities.
- .7 The Contractor shall coordinate field engineering and layout work with the Departmental Representative.

**1.6 ON-SITE DOCUMENTS**

- .1 The Contractor shall maintain at the job site, one copy each of the following:
  - .1 Contract Drawings.

- .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 Field test reports.
- .12 Copy of approved Work schedule and most recent updated schedule.
- .13 Labour conditions and wage schedules.
- .14 Applicable current editions of municipal regulations and by-laws.

#### **1.7 SUBMITTAL SCHEDULE**

- .1 The Contractor shall 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.
- .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.

#### **1.8 PROJECT SCHEDULES**

- .1 The Contractor shall submit preliminary construction progress schedule in accordance with Section 01 32 16.07 to Departmental Representative coordinated with Owner's project schedule.
- .2 After review, the Contractor shall revise and resubmit schedule to comply with revised project schedule.
- .3 During progress of Work the Contractor shall revise and resubmit as directed by the Departmental Representative.
- .4 In addition to the project schedule, the Contractor shall submit weekly schedules to the Departmental Representative showing Work planned for the following week on a day by day basis.

#### **1.9 CONSTRUCTION PROGRESS MEETINGS**

- .1 During course of Work prior to project completion, the Contractor shall schedule progress meetings weekly.
  - .1 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance. Meetings shall be chaired by the Departmental representative who will prepare the minutes of the meetings.
- .2 Agenda to include following:

- .1 Review, approval of minutes of previous meeting.
- .2 Review environmental issues.
- .3 Review Traffic Control and Emergency response Protocol issues.
- .4 Review site safety and security issues.
- .5 Review issues with Prime Contractor and co-ordination with other contractors.
- .6 Review of Work progress since previous meeting.
- .7 Discuss field observations, problems, and conflicts.
- .8 Review off-site fabrication delivery schedules.
- .9 Review submittal schedules: expedite as required.
- .10 Corrective measures and procedures to regain projected schedule.
- .11 Revisions to construction schedule.
- .12 Review Weekly Progress schedule, during succeeding work period.
- .13 Review of quality reports since previous meeting.
- .14 Review construction budget: Progress payments, variances from contract.
- .15 Other business.

#### **1.10 SUBMITTALS**

- .1 The Contractor shall submit product data to Section 01 33 00 for review for compliance with Contract Documents.
- .2 The Contractor shall submit requests for payment for review, and for transmittal to the Departmental Representative. Payment request on last day of the month.
- .3 The Contractor shall submit requests for interpretation of Contract Documents, and obtain instructions through Departmental Representative.
- .4 The Contractor shall process substitutions through Departmental Representative.
- .5 The Contractor shall process change orders through Departmental Representative.
- .6 The Contractor shall deliver closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative.

#### **1.11 CLOSEOUT PROCEDURES**

- .1 The Contractor shall notify the Departmental Representative when Work is considered ready for Substantial Performance (Interim Completion shall not be interpreted as Substantial Performance).
- .2 The Contractor shall accompany the Departmental Representative on preliminary inspection to determine items listed for completion or correction.
- .3 The Contractor shall comply with the Departmental Representative's instructions for correction of items of Work listed in executed certificate of Substantial Performance.
- .4 The Contractor shall notify the Departmental Representative of instructions for completion of items of Work determined in Departmental Representative's final inspection.

Project No. 201614

Parks Canada Agency

Trans-Canada Highway  
Avalanche Mitigations  
Mount Bosworth  
Yoho National Park

Section 01 3100  
PROJECT MANAGEMENT  
AND COORDINATION  
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**Part 2 Products**

.1 Not used.

**Part 3 Execution**

.1 Not used.

**END OF SECTION**

**Part 1 General****1.1 RELATED SECTIONS**

- .1 Section 01 11 00 – Summary of Work.
- .2 Section 01 14 00 – Work Restrictions.
- .3 Section 01 21 00 – Allowances.
- .4 Section 01 35 43 – Environmental Procedures.

**1.2 MEASUREMENT PROCEDURES**

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

**1.3 PRECEDENCE**

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

**1.4 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 approved plan for Project, plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Sunday, inclusive, will provide seven 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.

## 1.5 REQUIREMENTS

- .1 The Contractor shall ensure the Project Schedule is practical and remains within specified Contract duration.
- .2 The Contractor shall 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 The Contractor shall include an allowance in the schedule for Work performed and paid for as Prime Cost Sum. Refer to Section 01 21 00 – Allowances for a list of activities.
- .4 The Contractor shall complete the Work in accordance with Project Schedule.
- .5 The Contractor shall limit activity durations to maximum of approximately 14 working days, to allow for progress reporting.
- .6 The Contractor shall 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.
- .7 The Contractor shall include the requirements of Section 01 14 00 – Work Restrictions and Section 01 35 43 – Environmental Procedures.

## 1.6 SUBMITTALS

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

## 1.7 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule. Completion of each Stage of Construction:
  - .1 **Completion of Design, Supply and Storage of all materials: February 28, 2017 (Interim Completion)**  
(Interim Completion shall not be interpreted as Substantial Completion)
  - .2 **Completion of all project works: September 30, 2017 (Contract Completion)**

## 1.8 MASTER PLAN

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

## 1.9 PROJECT SCHEDULE

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



- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award.
  - .2 Permits.
  - .3 Submittals:
    - .1 Project Schedule
    - .2 List of subcontractors, suppliers and Departmental Representative
    - .3 Contractor Chain of Command including Sub-Contractors and Departmental Representatives
    - .4 Prime Contractor / co-ordination with other Contractors Plan
    - .5 Work Plan
    - .6 Environmental Protection Plan
    - .7 Traffic Management Plan
    - .8 Site access / Detour Plan
    - .9 Emergency Response Protocol
    - .10 Site Specific Health and Safety Plan, incl. MSDS sheets
    - .11 On site Contingency and Emergency Response Plan
    - .12 Management of Owner supplied material Plan
    - .13 Survey Plan
    - .14 Quality Control Plan
    - .15 Shop Drawings
    - .16 Concrete / Mix Designs
  - .4 Mobilization
  - .5 Work Activities by location:
    - .1 Site Access / Safety
    - .2 Rock scaling and bolting/ Excavation / Drilling
    - .3 Foundation construction
    - .4 Avalanche control system installation
    - .5 Additional Work as and when requested
  - .6 Quality Control
  - .7 Interim Inspection
  - .8 Site Clean-up / De-mobilization

#### **1.10 PROJECT SCHEDULE REPORTING**

- .1 The Contractor shall update the Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress. Provide weekly Progress Reports.
- .2 The Contractor shall include, as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

#### **1.11 PROJECT MEETINGS**

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

#### **Part 2 Products**

- .1 Not used.

#### **Part 3 Execution**

- .1 Not used.

**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 01 14 00 – Work Restrictions.
- .2 Section 01 32 16.07– Construction Progress Schedules - Bar (Gantt) Chart.
- .3 Section 01 35 29.06 – Health and Safety Requirements.
- .4 Section 01 35 00.06– Special Procedures for Traffic Control.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 01 45 00 – Quality Control.
- .7 Section 01 78 00 – Closeout Submittals.

### **1.2 MEASUREMENT PROCEDURES**

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

### **1.3 REFERENCES**

- .1 Not used.

### **1.4 ADMINISTRATIVE**

- .1 The Contractor shall submit to the Departmental Representative submittals listed for review. Submittals shall be prompt and in an 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 The Contractor shall not proceed with Work affected by submittal until review is complete.
- .3 The Contractor shall 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 The Contractor shall review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.
- .6 The Contractor shall notify the Departmental Representative in writing at time of submission, identifying any deviations from requirements of Contract Documents stating reasons for deviations.
- .7 The Contractor shall verify field measurements and affected adjacent Work is consistent.
- .8 The Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 The Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

- .10 The Contractor shall keep one reviewed copy of each submission on site.

## **1.5 “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 these specifications and shown on the drawings. “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 engineered design for proportioning materials in concrete or asphalt concrete pavement including all supporting test results, materials properties and Departmental Representative’s letter of recommendation.
- .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 design drawings and specifications.
- .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 The Contractor shall submit letter(s) of certification with all mix designs.
- .9 The Contractor shall 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:
  - .4 Subcontractor,

- .5 Supplier,
- .6 Manufacturer.
- .11 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with the Contract Documents.
- .12 Details of appropriate portions of the Work as applicable:
  - .1 Fabrication,
  - .2 Performance characteristics,
  - .3 Standards.
- .13 After the Departmental Representative's review, distribute copies.
- .14 Submit one (1) electronic copy of the shop drawings or mix design for each requirement requested in the Specification Sections and as requested by the Departmental Representative.
- .15 Submit one (1) electronic copy of the product data sheets or brochures for requirements requested in the Specification Sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of the product.
- .16 The Contractor shall delete information not applicable to project.
- .17 The Contractor shall supplement standard information to provide details applicable to project.
- .18 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.
- .19 The review of shop drawings and mix designs by Departmental Representative is for the sole purpose of ascertaining conformance with general concept. This review shall not mean that Departmental Representative approves detail 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.

## **1.6 SAMPLES**

- .1 Not used.

## **1.7 MOCK-UPS**

- .1 Not used.

## **1.8 CERTIFICATES AND TRANSCRIPTS**

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

## **1.9 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:
  - .1 The Contractor shall not begin any site Work until the Departmental Representative has authorized acceptance of submittals in writing. Submit the following plans and programs to the Departmental Representative for review a minimum of twenty (20) days prior to mobilization to the project site:
  - .2 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 11 00. 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
  - .3 List of subcontractors, suppliers and consultants, their role and their key personnel, including names and positions, addresses, telephone, cellular telephone and/or pager numbers.
  - .4 Plan describing methods the Contractor will have to meet his responsibilities as the Prime Contractor for Traffic Control in the Work zone.
  - .5 Contractor Chain of Command, listing key Contractor personnel, including for each name, position, qualification, experience, telephone, cellular telephone and/or pager numbers. The list shall include the names and telephone/cellular telephone/pager numbers for contact persons who are available on a 24-hour basis in the event of emergencies.
  - .6 Work Plan, describing in detail for each activity by location, the Contractor's intended methods of construction, and materials, equipment and manpower he will use to meet stages specified in Section 01 11 00. The Work Plan must be linked to the Project Schedule.
  - .7 Quality Control Plan in accordance with Section 01 45 00 – Quality Control.
  - .8 Traffic Management Plan, in accordance with the requirements of Section 01 35 00.06– Special Procedures for Traffic Control.
  - .9 Environmental Protection Plans (EPP) and Environmental Construction Operations Plans (ECO Plans) that shall meet the requirements of Section 01 35 43 – Environmental Procedures.
  - .10 Site Access and Detour Plans. It shall include, but not be limited to, engineered Drawings and procedures for accessing all areas of the Work or for proposed detours.

- .11 Survey Plan describing the Contractor's intended methods of surveying during this project.
- .12 Contractor shall develop an "Emergency Procedures Protocol" in consultation with Parks Canada. Parks Canada will supply the Contractor with a template with contact names and numbers to be used for this purpose.
- .13 Health and Safety Plan - The Contractor shall have a Certificate of Recognition (COR) and 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.
- .14 Health and Safety Plan must include:
  - .1 Contractor's safety policy.
  - .2 Identification of applicable compliance obligations.
  - .3 Definition of responsibilities for project safety/organization chart for project.
  - .4 Site specific hazard assessment.
  - .5 General safety rules for project.
  - .6 Job specific safe work procedures.
  - .7 Inspection policy and procedures.
  - .8 Incident reporting and investigation policy and procedures.
  - .9 Occupational Health and Safety meetings.
  - .10 Occupational Health and Safety communications and record keeping procedures.
  - .11 Results of safety and health risk or hazard analysis for site tasks and operation.
  - .12 Submit copies of Material Safety Data Sheets (MSDS).
  - .13 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
  - .14 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
  - .15 The Contractor shall not begin any site Work until the Departmental Representative has authorized acceptance of the submittals in writing.
- .15 Submit a copy of the filed Notice of Project with Provincial authorities.
- .3 Construction Phase Submittals
  - .1 Monthly Progress Reports in accordance with Section 01 32 16.07.
  - .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 location identified in project schedule and to provide

information on materials, equipment and manpower. Also, alternate Work to be identified if proposed Work or a portion thereof, cannot be done due to weather, equipment breakdown, delays in delivery, etc.

- .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 made available for review by the Departmental Representative upon request. A summary of all Quality Control inspections conducted to date shall be submitted by the Contractor with each request for payment.
- .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 30 days prior to planned fabrication / production.
- .5 Progress Photographs:
  - .1 Formats: 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 memory stick with 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.
- .8 Submit copies of incident and accident reports.
- .9 Project Completion Submittals
- .10 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.
- .11 Quality Control Records – The Contractor shall submit a bound and itemized set of project quality control documentation.
- .12 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.

**Part 2 Products**

.1 Not used.

**Part 3 Execution**

.1 Not used.

**END OF SECTION**

## **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 RELATED SECTIONS**

- .1 All Division 01, 02 and 03 Sections.

### **1.3 MEASUREMENT PROCEDURES**

- .2 Cost of Traffic Control, including temporary pavement marking, layout, and removal, described in this Section 01 35 00.06, shall be considered incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**, and no additional payment will be made for the duration of the Contract.
- .3 Cost of keeping existing roadway clean and free of debris and pot holes while Contractor is on site shall be considered incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**, and no additional payment will be made for the duration of the Contract.
- .4 Cost of snow removal for Contractor to do the work identified in the Contract while Contractor is on site shall be considered incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**, and no additional payment will be made for the duration of the Contract. This excludes snow removal on Public roads.

### **1.4 REFERENCES**

- .1 The Contractor shall provide traffic control in accordance with current edition of:
  - .1 BC MoTI - Traffic Control Manual for Work on Roadways.
  - .2 BC MoTI – 2012 Standard Specifications for Highway Construction, Section 194 – Traffic Management for Work Zones
  - .3 Manual of Uniform Traffic Control Devices for Canada, (MUTCD) distributed by Transportation Association of Canada.

### **1.5 QUALITY CONTROL**

- .1 All Quality Control by the Contractor.

### **1.6 GENERAL**

- .1 The Contractor shall develop and implement a Traffic Management Plan in accordance with BC MoTI 2012 Standard Specifications for Highway Construction, Section 194 – Traffic Management for Work zones, except where specified otherwise. The Traffic Management Plan will include plans specific to each detour and access point required for this project.
- .2 The Contractor shall submit all helicopter flight plans to the Departmental Representative for approval with reasonable time for review and revision prior to the scheduled flights.
- .3 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.
- .4 All temporary signs that are used for longer than one day shall be mounted on wood posts other than portable changeable message boards that shall be secured at all times.
  - .5 All traffic and warning signs shall be either bilingual or of a symbolic or pictorial type. If bilingual signs are used, the English and French message shall be of equal letter size and at the same elevation, with English on left and French on right. Assistance in translation of construction and warning signs to French may be obtained from Parks Canada.
  - .6 All speed limits, traffic control and warning signs shall have an “NPC” adhesive sticker added to bottom right-hand corner. These stickers will be supplied by Parks Canada following the acceptance by the Departmental Representative of the Contractor’s traffic management plan.
  - .7 **Temporary pavement marking used shall be acceptable to the Departmental Representative. These temporary pavement markings shall be in accordance with the current “BC MoTI - Traffic Control Manual for Work on Roadways”. All temporary pavement markings will be removed at the Contractor’s expense prior to the completion of the Contract.**
  - .8 Temporary pavement marking shall be in accordance with Section 32 17 23 – Pavement Marking.
  - .9 Contractor shall have appropriate traffic control measures in place so that two lanes of highway traffic are maintained through the work zone at all times throughout the construction.
  - .10 **The Contractor shall supply, install and maintain two portable Changeable Message Signs (CMS) to inform the traffic of construction delays. 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 two CMS will be incidental to “Lump Sum Price Item 2 – Traffic Accommodation”. Text for the two CMS will be directed by the Departmental Representative. Removal of the two CMS will only be permitted upon completion of the Works.**
  - .11 The control or closure of roadways and all associated traffic accommodation shall be considered incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**.
  - .12 The cleaning of debris from the roadway shall be considered incidental to **“Lump Sum Price Item 2 – Traffic Accommodation”**.

## 1.7 PROTECTION OF PUBLIC TRAFFIC

- .1 The Contractor shall comply with requirements of all Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over that it is necessary to carry out Work or haul materials or equipment.
- .2 When working on existing travelled way the Contractor shall:
  - .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 or debris on travelled way overnight.

- .4 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 current edition of the British Columbia – Traffic Control Manual for Work on Roadways, except where specified otherwise.
- .3 Regardless of type of traffic control being used, maximum period of delay to public traffic shall be 20 minutes except during the testing and commissioning phase. 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.
- .4 The Contractor shall keep travelled way clean, free of debris or pot holes and of sufficient width to accommodate two 5.0m wide lanes for traffic including shoulders, one in each direction.
- .5 The Contractor shall provide competent supervision and/or contract personnel as required during non-working hours to ensure that safety flares, flashing beacons, signs, lights, etc., are in proper working order.
- .6 The 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 and safety of traveling public.
- .7 If detours are required, all detours shall be paved and at access points the Contractor shall:
  - .1 Have posted speed limit at 50 km/hr with appropriate signage, temporary pavement marking and other safety features necessary.
  - .2 Keep areas clean, free of pot holes, failures, and rutting.
  - .3 Provide and maintain temporary markings.
  - .4 Provide competent supervision and/or contract personnel as required during non-working hours to ensure that safety flares, flashing beacons, signs, lights, etc. are in proper working order.

## 1.8 INFORMATIONAL AND WARNING DEVICES

- .1 The Contractor shall 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 The Contractor shall 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 posts suitably embedded below grade.**
- .3 The Contractor shall place signs and other devices to standards and in locations recommended in British Columbia - Traffic Control Manual for Work on Roadways.
- .4 Signs not installed longer than 1 day shall be wind resistant as per Windmaster 4818 or equivalent.
- .5 As the situation on site changes, Contractor to update his Traffic Management Plan outlining signs and other devices required for the project and submit for the approval of the Departmental Representative.
- .6 Continually inspect and maintain traffic control devices in use by:

- .7 Checking signs daily for legibility, damage, suitability and location.
- .8 Cleaning, repairing or replacing signs as required ensuring clarity and reflectance.
- .9 Removing or covering signs that do not apply to conditions existing from day to day or time to time.

## **1.9 CONTROL OF PUBLIC TRAFFIC**

- .1 The Contractor shall provide competent flag persons, trained in accordance with, and properly dressed and equipped as specified in, British Columbia - Traffic Control Manual for Work on Roadways:
  - .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 Where temporary protection is required while other traffic control devices are being erected or taken down.
  - .6 For emergency protection when other traffic control devices are not readily available.
  - .7 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
- .2 Stoppages to public traffic due to Contractor's operators shall be limited to a maximum of 20 minutes (except during testing and commissioning activities) following approval from the Departmental Representative.
- .3 During hours of darkness, Contractor shall determine requirements but as a minimum, flagpersons 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 During testing and commissioning, the Contractor shall coordinate all activities, closures and traffic control with PCA staff and the Departmental Representative to reduce closure time and disruption to the public.

## **1.10 OPERATIONAL REQUIREMENTS**

- .1 The Contractor shall 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 Maintain existing conditions for traffic crossing right-of-way.
- .5 No stoppage of traffic shall be allowed during inclement weather conditions.

**Part 2 Products**

- .1 Not used.

**Part 3 Execution**

- .1 Not used.

**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 01 14 00 – Work Restrictions
- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 43 – Environmental Procedures
- .3 Section 02 81 01– Hazardous Materials: Submission Requirements for WHMIS MSDS.

### **1.2 MEASUREMENT PROCEDURES**

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

### **1.3 REFERENCES**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Health Canada/Workplace Hazardous Materials Information System
- .3 (WHMIS).Material Safety Data Sheets (MSDS).
- .4 Province of British Columbia
- .5 Occupational Health and Safety Regulations.

### **1.4 SUBMITTALS**

- .1 The Contractor shall make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 The Contractor shall submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  - .1 Contractor's safety policy.
  - .2 Identification of applicable compliance obligations.
  - .3 Definition of responsibilities for project safety/organization chart for project.
  - .4 General safety rules for project.
  - .5 Job specific safe work procedures.
  - .6 Inspection policy and procedures.
  - .7 Incident reporting and investigation policy and procedures.
  - .8 Occupational Health and Safety meetings.
  - .9 Occupational Health and Safety communications and record keeping procedures.
  - .10 Results of site specific safety hazard assessment.
  - .11 Results of safety and health risk or hazard analysis for site tasks and operation.
  - .12 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.

- .13 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .14 Submit copies of incident and accident reports.
- .15 Submit copies of Material Safety Data Sheets (MSDS) to Departmental Representative.
- .16 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within ten (10) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within five (5) days after receipt of comments from Departmental Representative.
- .17 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .18 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .19 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

## 1.5 FILING OF NOTICE

- .1 **The Contractor shall file Notice of Project with Provincial authorities prior to beginning of Work and provide a copy of the notice to the Departmental Representative.**

## 1.6 SAFETY ASSESSMENT

- .1 The Contractor shall perform site specific safety hazard assessments related to project.

## 1.7 MEETINGS

- .1 The Contractor shall schedule and administer a Health and Safety meeting with Departmental Representative prior to commencement of Work.
- .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.
- .3 After contract award and prior to commencement of any work under the contract, the Project Manager will hold a health and safety meeting with the Contractor. 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.
- .4 A copy of the "Attestation and Proof of Compliance with Occupational Health and Safety (OHS)" form is attached as Appendix A.



## **1.8 REGULATORY REQUIREMENTS**

- .1 The Contractor shall do Work in accordance with National Parks Act.

## **1.9 PROJECT/SITE CONDITIONS**

- .1 Work at site will involve contact with British Columbia Occupational Health and Safety Act.

## **1.10 GENERAL REQUIREMENTS**

- .1 The Contractor shall develop written a 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. The 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.

## **1.11 RESPONSIBILITY**

- .1 The Contractor shall be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 The Contractor shall employ ACMG certified mountain guides and SPRAT or IRATA certified ropes access technicians as necessary to ensure safety of workers.
- .3 The Contractor shall 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.
- .4 The Contractor shall prepare a plan, and perform a detailed ground survey for unexploded ordnances using a metal detector or equivalent detector system approved by the Departmental Representative. The Contractor shall coordinate with PCA staff and ensure their safe removal from the site before work commences.
- .5 The Contractor shall include specific details regarding emergency site access, rescue and evacuation plans including but not limited to avalanches, landslides, inclement weather, and helicopter access. The Contractor shall be responsible for all costs associated for safety measures including the standby of any required safety personnel or equipment.

## **1.12 COMPLIANCE REQUIREMENTS**

- .1 The Contractor shall comply with WorkSafeBC and the Occupational Health and Safety Regulations of British Columbia.
- .2 The Contractor shall comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

## **1.13 UNFORESEEN HAZARDS**

- .1 When an unforeseen or peculiar safety-related factor, hazard, or condition occurs during performance of Work, the Contractor shall follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of British Columbia and advise Departmental Representative verbally and in writing.

#### **1.14 HEALTH AND SAFETY COORDINATOR**

- .1 The Contractor shall employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Co-ordinator must:
  - .1 Have working knowledge of occupational safety and health regulations.
  - .2 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.
  - .3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .4 Be on site during execution of Work and report directly to and be under direction of site supervisor.

#### **1.15 POSTING OF DOCUMENTS**

- .1 The Contractor shall ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of British Columbia and in consultation with Departmental Representative.

#### **1.16 CORRECTION OF NON-COMPLIANCE**

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

#### **1.17 WORK STOPPAGE**

- .1 The Contractor shall 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**

- .1 Not used.

#### **Part 3 Execution**

- .1 Not used.

**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED SECTIONS**

- .1 All Division 01, 02, 03, 05, 10, 31, 32, 33 and 34 Sections.

### **1.2 MEASUREMENT PROCEDURES**

- .1 Preparation and implementation of an Environmental Protection Plan in accordance with this Section 01 35 43 – Environmental Procedures 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 an Environmental Protection Plan in accordance with this Section.

### **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 For Work in Glacier NP, the Contractor and any sub-Contractors shall obtain a business license from the Parks Canada Administration Office in Lake Louise prior to commencement of the contract.
- .3 All Contractor's vehicles are required to display a vehicle work pass from Parks Canada. These permits may be obtained free of charge from the Departmental Representative or PCA Environmental Officer.

### **1.5 CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)**

- .1 Execution of the work is subject to the provisions within the *Canadian Environmental Assessment Act* (CEAA) Guidelines Order of 2003 and subsequent amendments.
- .2 Failure to comply with or observe environmental protection measures as identified in these specifications may result in the work being suspended pending rectification of the problems.
- .3 **Refer to the environmental requirements noted in the Basic Impact Analysis (BIA), July 2016, and BMP – HSC Environmental Procedures included with this tender. The Contractor's EPP is to include these mitigations and requirements as a minimum. The Contractor's EPP shall include any recommendations arising from this and any other environmental investigations performed by request of the Departmental Representative.**

### **1.6 START-UP AND ENVIRONMENTAL BRIEFING**

- .1 **All staff employed at the construction site will be subject to an approximately two hour briefing regarding their individual and collective responsibilities to ensure avoidable adverse environmental impact do not arise from their activities and personal choices. Employees must attend this briefing before beginning their work at the site.** Each employee, having received the briefing, will be issued a certification sticker to be displayed on their helmet. 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 monitor 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 monitor 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.

## **1.7 CONSTRUCTION SITE ACCESS AND PARKING**

- .1 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. Generally, personal vehicles shall be parked at least 10 metres distance from any watercourse.
- .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.

## **1.8 PROTECTION OF WORK LIMITS**

- .1 The Contractor is to prepare an EPP that details 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.

## **1.9 EROSION CONTROL**

- .1 Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the construction site are a critical element of the project and shall be implemented by the Contractor.
- .2 If necessary, on-site sediment control measures shall be constructed and functional prior to initiating activities associated with the asphalt plant and the paving. The Contractor shall prepare an Erosion Control Plan to the satisfaction of the Departmental Representative and the ESO.
- .3 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.
- .4 The site will be secured against erosion during any periods of construction inactivity or shutdown.

**1.10 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 as part of the EPP and shall detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products, to the satisfaction of the Departmental Representative and the ESO and in accordance with all applicable federal and provincial legislation. The EPP shall include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, 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 In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- .8 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.

**1.11 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 Yoho National Park 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 in # 4 of Pollution Control 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 Yoho National Park.
- .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 in Yoho National Park. Alternatively, the Contractor may hire a security person employed to prevent vandalism.

## 1.12 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.

### **1.13 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. Contractor's staff shall receive basic training in early response to wildfire events during the "environmental briefing".
- .2 A water truck may be necessary.
- .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.
- .5 Fires or burning of waste materials is not permitted.

### **1.14 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.

### **1.15 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 Yoho National Park 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.

### **1.16 WASTE MATERIALS STORAGE AND REMOVAL**

- .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 Yoho National Park. 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 Yoho National Park. 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.
- .7 Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition.

#### **1.17 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES**

- .1 The Contractor shall prepare an EPP that details how the work limits will 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.
- .2 A Contractor's office, work headquarters, material laydown, equipment parking and storage area will be in locations approved by Parks Canada and the Departmental Representative with the goal of minimizing impacts to visitor experience and safety, motorists, wildlife and water quality.
- .3 The National Park Act regulations prohibit anyone working within Yoho National Park from using public campground facilities.
- .4 Removal and storage of snow shall be arranged with the ESO and the Departmental Representative.
- .5 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 control measures for temporary access roads may also have to be initiated.
- .6 Security services at the construction site may be desirable or necessary during the contract, especially during quiet times. Fuel tanks or other potentially deleterious substance containers must be secured by the Contractor to ensure they are tamperproof and cannot be drained by vandals at his own cost.
- .7 Pets shall not be brought to or maintained at the construction site.



- .8 Should the Contractor require/request a water source the Departmental Representative, in consultation with the ESO, may give direction as to an acceptable location to be used. Specific intake measures are required when water is approved to be withdrawn from open watercourses.

## **Part 2 Products**

- .1 Not used.

## **Part 3 Execution**

### **3.1 CLEARING AND GRUBBING**

- .1 The Contractor shall ensure that the substrate or riparian area of streams, rivers or watercourses, whether open water or frozen over shall not be disturbed by tracked, wheeled or self-propelled equipment, (e.g. a skidder or truck). The ESO or Departmental Representative will provide direction in the case of work occurring near any wetland area or watercourses.
- .2 The 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. Generally, work within a 30 metre buffer of watercourses, water bodies or wetlands requires the close oversight of the ESO or the Departmental Representative.
- .3 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.
- .4 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.
- .5 No slash clearing, pickup or grubbing shall occur outside of the designated area or within 1 metre of the drip line of existing forest.
- .6 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 – Seeding.

### **3.2 STRIPPING**

- .1 A contingency plan for control of dust generated from the construction site shall be prepared, with materials availability arranged in the event of their need. In the event of a work program shutdown during inclement weather (e.g. winter conditions unfavourable for construction) erosion control of bared soils or excavated materials stockpiles will be required. The Contractor's EPP will describe measures to be implemented in such a circumstance.
- .2 Stripping close to any watercourse, water body or wetland shall employ methods to ensure materials are not pushed, fall or are eroded into the water or wetlands. Generally, work within a 30 metre buffer of waterways or wetlands requires the close oversight of the ESO and the Departmental Representative.

- .3 No stripping shall occur outside of the designated area or within 1 metre of the drip line of existing forest.
- .4 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.

### **3.3 MATERIAL LOADING, HAULING, PLACEMENT AND GRADE BUILDING**

- .1 During grade construction conducted close to any watercourse, water body or wetland methods shall be employed to ensure materials are not pushed, fall or are eroded into the water or wetlands. Generally, work within a 30 metre buffer of waterways or wetlands requires the close oversight of the ESO and the Departmental Representative.
- .2 No grade building shall occur outside of the designated area or within 1 metre of the drip line of existing forest. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that location. Materials shall be placed at storage sites or on the grade without spillage outside the working limits. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that location.

### **3.4 EXCAVATING AND PLACEMENT**

- .1 Excavation will be undertaken according to the design drawings.
- .2 Materials shall be placed at storage sites or on the grade without spillage outside the working limits. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that location.
- .3 All sediment control measures shall be implemented by the Contractor prior to the commencement of the work in the vicinity of water bodies, watercourses, and wetlands.
- .4 Special precautions may have to be taken during excavation in the vicinity of intermittent or active drainage channels. See "Specific Concerns".
- .5 If sediments enter watercourses during any excavation nearby or at its banks, the Contractor shall ensure that sediment levels in the waters of the river or creeks do not exceed specified limits and meet the "desired end result" limits outlined. See "Specific Concerns".
- .6 Fisheries protection windows shall be observed for any other watercourse in this contract and will guide the timing of the work so that stream disturbance is prevented. See "Specific Concerns".
- .7 If a pump-out sump to dewater excavation sites will be required, the Contractor is to prepare an EPP that details how the dewatering shall be undertaken, to the satisfaction of the Departmental Representative and the ESO. Special attention is to be given to the environmental sensitivity of the discharge area, freezing conditions operation, and overflow avoidance, decanting and settlement pond reclamation. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the Departmental Representative and the ESO.

**3.5 SPECIFIC CONCERNS RELATIVE TO EROSION CONTROL AND SEDIMENTATION**

- .1 The Contractor shall prepare an Erosion and Sedimentation Management Plan for the components of this contract that are undertaken in proximity to watercourses, wetlands or riparian environments. This plan shall be to the satisfaction of the Departmental Representative and ESO. If sediment ponds are required, they shall be designed to settle all sediment particles 0.02 mm or larger. The ponds shall also be designed to handle 1:5 year storm events, with overflow spill capacity for 1:10 year storm events and emergency spillway capacity for 1:100 year storm events.
- .2 An important desired end result is to allow 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.

**3.6 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**

**Part 1 General****1.1 RELATED SECTIONS**

- .1 All Division 01, 02 and 03 Sections.

**1.2 MEASUREMENT PROCEDURES**

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

**1.3 REFERENCES**

- .1 Canadian Standards Association (CSA)
- .2 CAN/CSA-A23.2-04, Methods of Test and Standard Practices for Concrete

**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, backfill, anchors and all source acceptance testing.
  - .2 All testing specified in the Contract Documents and the Manufacturer's Recommendations.
  - .3 Any other testing required as a condition for deviation from the specified Contract procedures or Manufacturer's Recommendations.
- .2 Testing proposed shall be based on testing requirements in the current edition of the British Columbia MoTI Standard Specifications for Highway Construction, as stated below, or as directed by the Departmental Representative.
- .3 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.
  - .4 Identify test reports with the name and address of the organization performing all tests, and the date of the tests.
- .4 Approval of tested samples will be for characteristics or use named in such approval and shall not change or modify any Contract requirements.
- .5 Testing agencies, their inspectors, and their representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the Contract Documents, nor to approve or accept any part of the Work

**1.5 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 Manual. 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 Manual 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.
  - .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 Specification compliance.

- .4 The Contractor shall appoint a qualified and experienced Quality Control Manager, 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 matters.
- .5 The Quality Control Manual 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 as required by law of British Columbia.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 The Departmental Representative will order 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, the Contractor shall correct such Work and pay cost of examination and correction.

## **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. The Contractor shall correct defect and irregularities as advised by the Departmental Representative at no cost to the Departmental Representative.

## **1.8 ACCESS TO WORK**

- .1 The Contractor shall allow inspection/testing agencies access to Work, off-site manufacturing and fabrication plants.
- .2 The Contractor shall co-operate to provide reasonable facilities for such access.

**1.9 PROCEDURES**

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

**1.10 REJECTED WORK**

- .1 The Contractor shall remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, that has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 The Contractor shall make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the Owner may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount that will be determined by Departmental Representative.

**1.11 REPORTS**

- .1 The Contractor shall submit one (1) electronic copy of all inspection and test reports to Departmental Representative in accordance with Section 01 33 00 Submittals Procedures.

**1.12 TESTS AND MIX DESIGNS**

- .1 The Contractor shall furnish test results and designs as may be requested.

**1.13 MILL TESTS**

- .1 The Contractor shall submit mill test certificates as required of specification sections.

**Part 2 Products**

- .1 Not used.

**Part 3 Execution**

- .1 Not used.

**END OF SECTION**

**Part 1 General****1.1 RELATED SECTIONS**

- .1 Section 01 35 00.06 - Special Procedures for Traffic Control.

**1.2 MEASUREMENT PROCEDURES**

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

**1.3 INSTALLATION AND REMOVAL**

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

**1.4 SITE STORAGE/LOADING**

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

**1.5 CONSTRUCTION PARKING**

- .1 The Contractor shall provide and maintain adequate access and parking at the project site in areas approved by the Departmental Representative.
- .2 If authorized to use existing roads or other access to project site, the Contractor shall maintain such roads and accesses for duration of Contract and make good damage resulting from Contractors' use.

**1.6 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.

**1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE**

- .1 The Contractor shall provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials if required.
- .2 The Contractor shall locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

**1.8 SANITARY FACILITIES**

- .1 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations, ordinances and the EPP.
- .2 The Contractor shall post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.



## **1.9 CONSTRUCTION SIGNAGE**

- .1 No other signs or advertisements, other than warning and traffic control signs, are permitted on site.
- .2 Signs and notices for safety and instruction shall be in both official languages Graphic symbols shall conform to CAN3-Z321.
- .3 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by Departmental Representative.

### **Part 2 Products**

- .1 Not used.

### **Part 3 Execution**

- .1 Not used.

**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 01 45 00 - Quality Control.

### **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 specifications.
- .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 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.
- .2 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.
- .3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

### **1.4 AVAILABILITY**

- .1 Immediately after signing the contract, the Contractor shall 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, the Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

**1.5 STORAGE, HANDLING AND PROTECTION**

- .1 The Contractor shall handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 The Contractor shall 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 The Contractor shall store products subject to damage from weather in weatherproof enclosures.
- .4 The Contractor shall store cementitious products clear of earth or concrete floors, and away from walls.
- .5 The Contractor shall 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 The Contractor shall store sheet materials, lumber and misc. metals on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 The Contractor shall 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 The Contractor shall remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 The Contractor shall 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 The Contractor shall pay costs of transportation of products required in performance of Work.

**1.7 MANUFACTURER'S INSTRUCTIONS**

- .1 Unless otherwise indicated in specifications, the Contractor shall install or erect products in accordance with manufacturer's instructions. The Contractor shall not rely on labels or enclosures provided with products. The Contractor shall obtain written instructions directly from manufacturers.
- .2 The Contractor shall notify the Departmental Representative in writing, of conflicts between specifications 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 the Departmental Representative to require removal and re-installation by the Contractor at no increase in Contract Price or Contract Time.

**1.8 QUALITY OF WORK**

- .1 The Contractor shall ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties that they are employed. Immediately notify

Departmental Representative if required Work is such as to make it impractical to produce required results.

- .2 The Contractor shall not employ anyone unskilled in their required duties. The Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with the Departmental Representative whose decision is final.

## **1.9 CO-ORDINATION**

- .1 The Contractor shall ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 The Contractor shall be responsible for coordination and placement of openings, sleeves and accessories.

## **1.10 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.

## **1.11 REMEDIAL WORK**

- .1 The Contractor shall 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 The Contractor shall perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

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

- .1 The Contractor shall 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 BC MoTI – 2012 Standard Specifications for Highway Construction, or as directed by the Departmental Representative.

## **Part 3 Execution**

- .1 Work shall be in accordance with BC MoTI – 2012 Standard Specifications for Highway Construction, or as directed by the Departmental Representative.

**END OF SECTION**

## **Part 1 General**

### **1.1 MEASUREMENT PROCEDURES**

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

### **1.2 RELATED SECTIONS**

- .1 Section 01 32 16.07- Construction Progress Schedules – Bar (GANTT) Chart.

### **1.3 REFERENCES**

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

### **1.4 QUALIFICATIONS OF SURVEYOR**

- .1 Qualified surveyor, licensed to practise in British Columbia, acceptable to Departmental Representative.

### **1.5 SURVEY / LAYOUT REQUIREMENTS**

- .1 The Departmental Representative will indicate the project locations and sufficient reference points and other information for horizontal and vertical control, to be used by the Contractor for his detailed layout. The Contractor shall protect and shall not remove or destroy, or permit to be removed or destroyed, the stakes or marks set as reference points by the Departmental Representative. Subsequent to the initial reference points staking performed by the Departmental Representative, the Contractor shall perform all layout, survey and construction staking necessary to meet specified requirements for any type of construction.
- .2 The Contractor's detailed survey layout for construction shall include a complete base-line displaying project stationing at 20 m intervals suitable for referencing test locations and for purposes of measurement for payment.

### **1.6 SURVEY REFERENCE POINTS**

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

### **1.7 SURVEY REQUIREMENTS**

- .1 Contractor will be responsible for all staking and layout including but not limited to:
  - .1 Establish lines and levels, locate and lay out, by instrumentation.
  - .2 Survey Staking;

.3 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.
- .2 Reference Survey Control Points that are in danger of being damaged or destroyed.
- .3 The Departmental Representative will complete all measurement surveys for payment.

**1.8 RECORDS**

- .1 The Contractor shall maintain a complete, accurate log of control and survey work as it progresses.
- .2 The Contractor shall record locations of maintained, re-routed and abandoned service lines.

**1.9 SUBMITTALS**

- .1 The Contractor shall submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, the Contractor shall submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying those elevations and locations of completed Work that conform to Contract Documents.

**Part 2 Products**

- .1 Not used.

**Part 3 Execution**

- .1 Not used.

**END OF SECTION**

## **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 MEASUREMENT PROCEDURES**

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

### **1.3 RELATED SECTION**

- .1 Section 01 35 00.06– Special Procedures for Traffic Control.
- .2 Section 01 35 43 – Environmental Procedures.
- .3 Section 01 77 00 - Closeout Procedures.

### **1.4 PROJECT CLEANLINESS**

- .1 The Contractor shall maintain the Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 The Contractor shall clear snow and ice from access to work areas during active construction periods and when access to environmental protection facilities required outside active construction times.
- .3 The Contractor shall make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 The Contractor shall remove waste material and debris from site at end of each working day and dispose of waste materials and debris off site as directed by Departmental Representative. Do not burn waste materials on site.
- .5 The Contractor shall keep roadways debris, dust and rock free daily by sweeping areas that mud and dirt is brought to the road by equipment, vehicles or slides.
- .6 The Contractor shall store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .7 The Contractor shall provide adequate ventilation during use of volatile or noxious substances.
- .8 The Contractor shall use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

### **1.5 FINAL CLEANING**

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

- .4 The Contractor shall make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 The Contractor shall inspect finishes, and ensure specified workmanship and operation.
- .6 The Contractor shall remove dirt and other disfiguration from exterior surfaces.
- .7 The Contractor shall sweep and wash clean paved areas.
- .8 The Contractor shall clean drainage systems.

**Part 2 Products**

- .1 Not used.

**Part 3 Execution**

- .1 Not used.

**END OF SECTION**



## **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 MEASUREMENT PROCEDURES**

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

### **1.3 RELATED SECTIONS**

- .1 Section 01 74 11 – Cleaning.
- .2 Section 017800 – Closeout Submittals.

### **1.4 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.
- .2 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
- .3 Request Departmental Representative's Inspection.
- .4 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.
- .5 Completion: submit written certificate that following have been performed:
- .6 Work has been completed and inspected for compliance with Contract Documents.
- .7 Defects have been corrected and deficiencies have been completed.
- .8 Work is complete and ready for Final Inspection.
- .9 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**

- .1 Not used.

## **Part 3 Execution**

- .1 Not used.

**END OF SECTION**

**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 MEASUREMENT PROCEDURES**

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

**1.3 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 014500 - Quality Control.
- .3 Section 01 71 00 - Examination and Preparation.
- .4 Section 01 77 00 - Closeout Procedures.

**1.4 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.

**1.5 MAINTENANCE AND OPERATION MANUAL**

- .1 The Contractor shall prepare and submit a Maintenance and Operations Manual which will be used during the training of the PCA staff. This manual shall include but is not limited to the following:

□

- .1 Equipment models and serial numbers;
- .2 Procedures for inspections and maintenance;
- .3 Procedures for operations;
- .4 Safety requirements;
- .5 Contact information for replacement parts and consumables;
- .6 Shop drawings of all consumables;
- .7 Contact information for service locations;
- .8 Site access methods and plans;
- .9 Troubleshooting;
- .10 Schedules for inspections and maintenance.

## **1.6 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.
  - .5 Specifications: legibly mark each item to record actual construction, including:
  - .6 Changes made by Addenda and change orders.

## **1.7 FINAL SURVEY**

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

## **1.8 WARRANTIES AND BONDS**

- .1 The Contractor shall separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 The Contractor shall list subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 The Contractor shall 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, the Contractor shall leave date of beginning of time of warranty until the Date of Substantial Performance is determined (Interim Completion shall not be interpreted as Substantial Performance).
- .5 The Contractor shall verify that documents are in proper form, contain full information, and are notarized.
- .6 The Contractor shall co-execute submittals when required.
- .7 The Contractor shall retain warranties and bonds until time specified for submittal.

**Part 2 Products**

- .1 Not used.

**Part 3 Execution**

- .1 Not used.

**END OF SECTION**

**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 MEASUREMENT PROCEDURES**

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

**1.3 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 43 – Environmental Procedures.

**1.4 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).
- .5 Explosives Act (R.S.C., 1985, c. E-17)

**1.5 COMPLIANCE REQUIREMENTS**

- .1 The Contractor shall comply with the Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34), the Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286), and the Explosives Act (R.S.C., 1985, c. E-17).

**1.6 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.

**1.7 SUBMITTALS**

- .1 Submit product data in accordance with Section 013300 - Submittal Procedures.

- .2 Submit to Departmental Representative current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.
- .3 Submit hazardous materials management plan to Departmental Representative that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

## 1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
- .4 Storage and Handling Requirements:
  - .1 Co-ordinate 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 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 unless previously approved by the Departmental Representative.
  - .5 All designs and implementations must conform to the requirements of any licenses, permits, registrations or guidelines issued by any Canadian authority having jurisdiction.
  - ~~.6 Arming of explosives shall take place at a RACS operational deployment site, to be approved by the Departmental Representative prior to arming. Arming at any other location is not permitted.~~

Arming of explosives shall take place at a RACS operational deployment site, that is the final installed location of each RACS, or at a location approved by the Departmental Representative prior to arming. Contractors shall assume that RACS must be armed at the operational deployment site during bidding. After Contract Award, the Contractor may request permission from the Departmental Representative to arm at another location, but the Departmental Representative may accept or refuse the request.
  - .7 It is prohibited to fly armed explosives over a public road, highway or facility. The system shall be designed such that armed explosives are never flown over a public road, highway or facility.
  - .8 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
  - .9 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

- .10 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.
- .11 Transfer of flammable and combustible liquids is prohibited within buildings.
- .12 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
- .13 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
- .14 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
- .15 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
- .5 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.
  - .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 stored in separate containers.
- .6 Store hazardous materials and wastes in secure storage area with controlled access.
- .7 Maintain clear egress from storage area.
- .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
- .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
- .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

## **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 DISPOSAL**

- .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

- .2 Recycle hazardous wastes that there is an approved, cost effective recycling process available.
- .3 Send hazardous wastes only to authorized hazardous waste disposal or treatment facilities.
- .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
- .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited. Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.
- .6 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
- .7 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
- .8 Hazardous wastes recycled in manner constituting disposal.
- .9 Hazardous waste burned for energy recovery.
- .10 Lead-acid battery recycling.
- .11 Hazardous wastes with economically recoverable precious metals.

**END OF SECTION**



**Part 1 General****1.1 MEASUREMENT PROCEDURES**

- .1 Detailed design and submittal of shop drawings in accordance with the plans and specifications shall be considered incidental to **“Lump Sum Price Item 4a – Mount Bosworth RACS”**.
- .2 The quantity of RACS units that are delivered and stored in accordance with the specifications of this Contract, to a location in Western Canada subject to approval by the Departmental Representative, shall be measured per target controlled, not per RACS unit supplied, and shall include all equipment and infrastructure required for avalanche control of the required targets. No required number of RACS units has been specified in this Contract. The Contractor is responsible for supplying an adequate number of RACS units in order to control the required targets. Payment will be made per target controlled, not per RACS unit supplied. Payment will be made under **“Unit Price Item 1a – Mount Bosworth RACS”**.
- .3 The quantity of permanent helicopter landing pads constructed adjacent to the RACS installations at locations approved by the Departmental Representative shall be measured per helicopter pad installed and shall include the engineered design, the supply and transportation of all materials and equipment necessary for the work, labour, and helicopter access. Payment will be up to 20% of each unit on acceptance of the finalized design for each location, up to 40% of each unit on installation of foundations, and the remaining 60% of each unit upon construction completion. Payment will be made under **“Unit Price Item 1b – Mount Bosworth RACS”**.
- .4 Survey, layout, transportation of RACS from storage area to the site, construction and assembly of the RACS units and operating system, including supply and install of operating system hardware and software, and linking of the RACS telemetry system to the Banff Warden Office, shall be paid under **“Lump Sum Price Item 4b – Mount Bosworth RACS”**, and shall be inclusive of all costs of labour, materials, permits, licenses, manuals, documentation and equipment to satisfactorily complete this item as specified and in accordance with Section 33 42 36 – Special Procedures RACS.
- .5 Testing and commissioning of the RACS once installed, including the supply and loading of consumables necessary for testing, commissioning and the first year of avalanche control, and helicopter access, if required, shall be paid under **“Lump Sum Price Item 4c – Mount Bosworth RACS”**.
- .6 Training of Parks Canada staff to operate, resupply, maintain and service the RACS, including the supply of consumables and documentation, and helicopter access, if required, shall be paid under **“Lump Sum Unit Price Item 4d – Mount Bosworth RACS”**.
- .7 Other Work required shall be paid under the following items:
  - .1 Mobilization and demobilization required for the installation of RACS shall be incidental to **“Lump Sum Price Item 1 – Mobilization / Demobilization”**, and no additional payment will be made. No payment for Mobilization or Demobilization shall be made for the design, supply and storage of RACS in accordance with Section 01 25 20.

- .2 Traffic Control during the survey, layout and construction shall be paid under **“Lump Sum Price Item 2 – Traffic Accommodation”** and shall include all necessary traffic control in order to safely fly materials over the highway from the staging area to the work site.
- .12 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures, for the Work in this Section shall be incidental to the contract and no separate payment shall be made to the Contractor.

## 1.2 LOCATION

- .1 RACS target locations are indicated on Drawing 002, Photos 1 – 3, and in the Remote Avalanche Control Targets KMZ file.

Please note that the Google Earth imagery for Mount Bosworth is not georeferenced correctly. As such, the targets in the Avalanche Control Targets KMZ file appear to be in the wrong locations if opened in Google Earth. Proponents are encouraged to use any GIS software (e.g. ArcGIS, QGIS, etc.) that can load online imagery, and to ensure that said imagery is correctly georeferenced.

## 1.3 SCHEDULE

- .1 Work shall be in accordance with Section 01 14 00 – Work Restrictions unless otherwise approved by the Departmental Representative.

## 1.4 TRAFFIC CONTROL REQUIREMENTS

- .1 The Contractor shall provide traffic control in accordance with Section 01 35 00.06 - Special Procedures for Traffic Control.

## 1.5 STAGED CONSTRUCTION

- .1 Provisions for staged construction shall be shown in the shop drawings, including any temporary support required, until RACS are complete.

## 1.6 DESIGN REVIEW

- .1 The Contractor shall provide the Departmental Representative with one (1) electronic copy of complete working Drawings, and one (1) electronic copy of detailed design calculations, for review at least 4 weeks prior to the planned fabrication or manufacture. Drawings and design calculations to bear signature and stamp of qualified Professional Engineer registered in Province of British Columbia, Canada.
- .2 The Contractor shall verify existing site conditions and ground elevations before preparing working Drawings.
- .3 Contractor to note that the targets shown on the drawings indicate the specific locations where explosions are required in order for PCA to perform avalanche control. Based on this information, the performance criteria, and the Geotechnical Report, the Contractor shall provide the make and model, configuration, alignment and sizes of the proposed RACS, subject to approval by the Departmental Representative. The following conditions will apply:

1. The Contractor shall include diagrams of the location of all structures and targets for each avalanche control device (the diagrams should be drawn on copies of the attached Drawings 002 & 003).
2. The Contractor shall include in his submittal written specifications that detail the number of explosions that can be delivered by the system to each start zone without requiring replenishment of parts or supplies.
3. ~~The Contractor shall include in his submittal documentation that shows individual detonations from the devices have the explosive force equal to or greater than the explosive force that is characteristic of 3 kilograms of TNT. Include details of the size of the component or the size of explosive charge for each target location.~~  
The Contractor shall include in his submittal documentation that shows individual detonations from device have the explosive force equal to or greater than the explosive force that is characteristic of the detonation of 4 kilograms of TNT above the snowpack or 12.5 kilograms of ANFO within the snowpack. Include details of the size of the component or size of explosive charge for each target location.
4. The Contractor shall include in his submittal a statement that military artillery ammunition is not used in the proposed system.
5. The Contractor shall include in his submittal documentation showing all wiring, and includes a schedule of all electrical and electronic parts as well as detailed specifications of the environmental operating range of all electronic and electrical components.
6. The Contractor shall include in his submittal detailed specifications of the environmental operating range of the avalanche control system including temperature, wind speed, relative humidity, snowfall rate and precipitation rate.
7. The Contractor shall include in his submittal a statement that, prior to installation, a qualified (APEGBC) Professional Geotechnical Engineer will certify that the engineered foundations and structural components have been designed to meet the geological conditions found at the sites.
8. The Contractor shall include in his submittal specifications that detail the types and methods of rust prevention that will be used.
9. The Contractor shall include in his submittal details of how each component of the system will be protected from the effects of lightning.
10. The Contractor shall include in his submittal details of which components and locations must be accessed by workers during replenishment of the consumable supplies.
11. The Contractor shall include in his submittal a description of the telemetry system that will be employed for firing the device including a statement that the telemetry system will be capable of remotely firing the device from a location safe from snow avalanche on the existing highway.
12. The Contractor shall include in his submittal written details of the design and function of the system equipment for detecting, confirming and reporting individual detonations.

13. The Contractor shall include in his submittal details of the system's ability to report the measured number of detonations available for avalanche control attempts in each start zone.
14. The Contractor shall include in his submittal a description of whether the system's target is stationary or can be adjusted, and shall include the method of adjusting the target locations if applicable.
15. The Contractor shall include in his submittal documentation of the environmental and weather monitoring capabilities.
16. The Contractor shall include in his submittal a description of the system that will indicate the state of operational readiness of the whole system from the Banff Warden Office.
17. The Contractor shall not change the make and model of the proposed RACS provided at the time of bidding, unless approved by the Departmental Representative.
18. The Contractor shall include in his submittal a detailed description of annual maintenance requirements and any other maintenance requirements during the system's service life. The Contractor shall also include in his submittal a detailed cost breakdown of said maintenance costs and a typical maintenance contract to be considered by PCA separate to this Contract.
- .4 The Departmental Representative retains right of final approval for equivalent products and locations.
- .5 Shop Drawings, the Contractor shall:
  - .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
  - .2 Submit shop drawings of all required consumables.
  - .3 Ensure each drawing submitted bears stamp and signature of qualified Professional Engineer registered in the Province of British Columbia.

## 1.7 DESIGN CRITERIA

1. The Contractor shall design to ensure minimum effective service life of 25 years.
2. The Contractor shall design to ensure all components operate at the environmental range experienced at Mount Bosworth, specifically for a location that receives equivalent weather conditions to the proposed sites, as observed in the weather data attached in Appendix B.
3. All materials and components must be designed, constructed and installed in accordance with the following current codes and regulations:
  - .1 National Building Code (Canadian), where applicable
  - .2 Workers Compensation Board regulation (Province of BC), where applicable
  - .3 British Columbia Electrical Code (wiring)
  - .4 WHMIS, where applicable
  - .5 Canadian Radio-television and Telecommunications Commission regulations, where applicable
  - .6 Natural Resources Canada Explosives Regulatory Division regulations, where applicable
  - .7 Transportation of Dangerous Good regulations, where applicable

#### .8 BC Safety Authority

4. All systems must abide by all relevant licensing and permitting requirements. For details on licensing and permitting requirements, it is the Contractor's responsibility to contact any authorities directly and to act as agent, once approved to do so, on behalf of Parks in obtaining the necessary permits.

### 1.8 PERFORMANCE REQUIREMENTS

- .1 Tolerances in fabrication and installation as per Manufacturer's recommendations.

- .2 All RACS supplied and installed under this Contract shall be manufactured by the same supplier.

~~.3 The Contractor shall ensure that each target is within the effective blast radius of at least one RACS for the described avalanche paths. No required number of RACS units has been specified in this Contract. The Contractor is responsible for supplying an adequate number of RACS units in order to control the required targets. Therefore, the total number of RACS units may not necessarily equal the total number of targets controlled. Payment will be made per target controlled, not per RACS unit supplied.~~

The Contractor shall ensure that each Control Target and the whole of each Control Target Area shown on Drawing 002 is within the effective blast radius of at least one RACS. Please note that the displayed Control Targets are those currently used by the Avalanche Control Team and it is desirable that maximum blast effect is focused at the Control Targets. No required number of RACS units has been specified in this Contract. The Contractor is responsible for supplying an adequate number of RACS units in order to control all Control Targets and Control Target Areas shown on Drawing 002. Therefore, the total number of RACS units may not necessarily equal the total number of targets controlled. Payment will be made per target controlled, not per RACS unit supplied.

- .4 The Contractor shall ensure that alarms and redundancies are in place in case of communications equipment or blast confirmation failures.
- .5 The Contractor shall ensure the system is capable of tracking non-exploded ordnances.
- .6 The system must provide avalanche control capabilities to initiate and clear avalanches from all targets indicated in the attached drawings.
- .7 Individual detonations from the devices must produce an explosive force equal to or greater than the explosive forces that are characteristic of the detonation of 4 kilograms of TNT above the snowpack or 12.5 kilograms of ANFO within the snowpack.
- .8 The system shall not use military artillery ammunition.
- .9 All designs and implementations must conform to the requirements of any licenses, permits, registrations or guidelines issued by any Canadian authority having jurisdiction.
- .10 The Contractor shall obtain all relevant permits and licenses, and comply with the Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34), the Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286), the Explosives Act (R.S.C., 1985, c. E-17), any Natural Resources Canada Explosives Regulatory Division regulations and any Worksafe BC requirements at all times, and specifically when arming explosives or flying

- armed explosives over a public road, highway, facility or densely populated area. The arming location must be approved by the Departmental Representative prior to arming.
- .11 The construction of any infrastructure or facilities additional to those provided by PCA or outlined in this Contract shall be incidental to the work. This includes explosives storage magazines, facilities for temporary summer storage of removable RACS, and other storage facilities. Additional infrastructure or facilities will be constructed at the PCA Compound in Field, however final locations and facility sizes are subject to approval by the Departmental Representative. Explosives intended for use in the proceeding control period will be stored short-term in the PCA Type 1 explosives magazine located near Banff. PCA will only provide storage space for spare parts used for routine maintenance.
  - .12 The system shall not use bomb tramway methods.
  - .13 The entire system, including, but not limited to, all electronic and electrical components, must be operable and remain able to conduct avalanche control during all winter conditions. See Clause 1.8.2, this section.
  - .14 The system must be structurally designed for installation in the geological conditions found at the sites as described in the attached Golder Geotechnical Assessment, and according to any requirements specified by further geotechnical analysis performed at the request of the Departmental Representative or as required by the Contractor's Professional Geotechnical Engineer. The Contractor is responsible for a detailed geotechnical investigation and/or geotechnical testing if required to perform the Work.
  - .15 The Contractor will be responsible for preparing all foundation engineered form work drawings, concrete drawings and drawings of any other structures.
  - .16 All parts of the system must be treated to inhibit or prevent rust or made of material that prevents rust.
  - .17 Each device and component must be protected from the effects of lightning.
  - .18 The system must not require workers to enter avalanche start zones during replenishment of the consumable supplies when snow is present at the location.
  - .19 The system shall be capable of being remotely controlled from a location, safe from snow avalanches, on the existing highway. The system shall include security features in the wireless communication to avoid tampering or accidental detonations.
  - .20 The Contractor shall include a method to confirm each detonation in the system. Each detonation shall be individually recorded by a detection system and reported to the operator via the installed telemetry system. The Contractor shall supply the computer (PC / Lap-top) for the telemetry software, and all software and hardware licenses.
  - .21 The system shall supply to the operator, via the installed telemetry system, a current measurement of the number of detonations available for each start zone.
  - .22 The system shall allow the operator to establish contact with the RACS from the Banff Warden Office (216 Hawk Avenue, Banff, AB) at any time via the telemetry system for the purpose of examining the status of the equipment and magazine, and determining the state of operational readiness. The Contractor will coordinate with PCA to establish this connection. The Contractor shall supply PCA with a Human Machine Interface which performs the aforementioned functions.

- .23 The system shall allow the operator to activate all the RACS units within the Mount Bosworth group from a single line of sight activation point.
- .24 The system components shall be installed on structurally engineered foundations that will provide adequate height to components and structures that are designed to be accessed or to operate above the snow surface.
- .25 The design and construction of the system must ensure that all installed components are able to withstand the effects of natural forces that will be encountered at each location where the components are installed. These forces include, but are not limited to, the effects of avalanche, rock fall, seasonal snow cover, frost jacking, snow glide, snow creep and wind loads.
- ~~.26 The Contractor shall ensure that safety measures are in place for worker access to all RACS components in any season, and that these comply with industry best practices and BC MoTI – 2012 Standard Specifications for Highway Construction. The design, supply and installation of permanent rock fall mitigation systems is considered incidental to the work and no separate payment shall be made.~~
- The Contractor shall ensure that safety measures are in place for worker access to all RACS components when snow is not present at the location, and that these comply with industry best practices and BC MoTI – 2012 Standard Specifications for Highway Construction. The design, supply and installation of permanent rock fall mitigation systems is considered incidental to the work and no separate payment shall be made.
- .27 The Contractor shall be familiar with the forces that are to be encountered at all sites where components of the system will be located and shall select locations that will minimize the exposure of workers and equipment to these forces.
- ~~.28 The Contractor shall submit an outline of the procurement process for consumables, including a list of suppliers, transportation requirements, and permits and licensing. The Contractor shall also include a cost estimate for consumables, including transportation to Rogers Pass.~~
- The Contractor shall submit an outline of the procurement process for consumables, including a list of suppliers, transportation requirements, and permits and licensing. The Contractor shall also include a cost estimate for consumables, including transportation to the PCA Type 1 explosives near Banff.
- .29 The Contractor shall supply all consumables required for testing, commissioning and training, as well as all consumables required for the first year of avalanche control. Upon completion of commissioning the RACS, it is the responsibility of the Contractor to load all consumables required for the first year of avalanche control into the RACS. The Works will not be complete until the RACS are loaded and ready to perform the first year of avalanche control. The purchase of any consumables additional to the aforementioned shall be negotiated by Parks and shall be separate to this contract. The Contractor shall be able to supply all consumables required by the system to PCA should Parks request this service.
- .30 RACS must be able to deliver, as a minimum, the following number of explosions at each target (see drawings) ~~in one avalanche season, without prior to requiring replenishment of any parts or supplies~~. Any deviation from these numbers shall be subject to approval by the Departmental Representative.

Path Name	Target ID	Minimum Recommended RACS Explosions
Bosworth #3	3-1a & 3-1b*	10*
	3-2	10
	3-3	10
Bosworth #4	4-1	10
	4-2	10
	4-3	10
Bosworth #5	5-1	10
	5-2	10
	5-3	10
	5-4	10

\*Please note that a total of ten (10) explosions are required for targets 3-1a and 3-1b, not ten explosions per target. The system(s) that service(s) these targets must be able to affect both targets equally.

.31 All explosives deployed in slide path #3 shall be tethered to the RACS in such a way as to prevent them from sliding beyond the target area.

.32 The Contractor shall ensure that the design includes a minimum of two RACS units per slide path.

## 1.9 STORAGE AND HANDLING OF EQUIPMENT

- .1 The Contractor shall follow storage and handling instructions of RACS supplier.
- .2 All RACS equipment shall be delivered and stored at a location within Western Canada provided by the Contractor prior to February 28, 2017. Equipment to remain stored at the location until time of installation. The Contractor shall coordinate the storage site with the Departmental Representative and shall satisfy himself with the conditions of the storage site prior to February 28, 2017.
- .3 The Contractor shall be responsible for any damage that occurs to the systems during storage and no additional payment for repairs shall be made.
- .4 The Contractor shall be responsible for all costs associated with the storage and security of the systems, and no additional payment shall be made.

## 1.10 QUALITY CONTROL – TESTING

- .1 All Quality Control testing shall be performed by the Contractor.
- .2 Testing shall be as per approved Manufacturer's and Contractor's Quality Control Plan.
- .3 The Contractor is required to complete all inspections as required by the RACS manufacturer, as recommended by any of the additional system Design Engineers, or as a result of studies carried out as part of the installation of the RACS.



## 1.11 WARRANTY

- .1 In addition to any other requirement of the Contract, all material and workmanship shall be under warranty for one year after the date of Final Certificate of Completion. All parts, hardware, software, and any other materials supplied and/or installed by the Contractor for a period of 12 months from the date of final acceptance that fail to operate, break, are defective or show unusual wear will be replaced or repaired by the Contractor without charge for material or costs associated with reinstallation. The period of time for initiating rectification of any defects or other condition within the warranty period shall not exceed 96 hours.
- .2 All workmanship shall be under warranty for one (1) year after the date of the Final Certificate of Completion.

## Part 2 Execution

### 2.1 STAGING

- ~~.1 The Staging Area for this work is Niblock Pit, located approximately 500m NW of the TCH on Highway 93N, as shown on Drawing 001 and the Staging Area KMZ file. The area available for staging at this location is ~1000 square meters. The Staging Area will be closed for public use, suitable for helicopter operations, and suitable for storage of fuel and support equipment/supplies according to Section 01 35 43. The Contractor is responsible for preparing the Staging Area to the specifications of Clause 2.2 Work Site Preparation, this Section. The designated area will be the laydown for materials receiving and storage during Construction.~~

The Staging Area for this work is Shale Pit, located at TCH km 75.5, as shown on Drawing 001 and the Staging Area KMZ file. The area available for staging at this location is ~1000 square meters. The Staging Area will be closed for public use, suitable for helicopter operations, and suitable for storage of fuel and support equipment/supplies according to Section 01 35 43. The Contractor is responsible for preparing the Staging Area to the specifications of Clause 2.2 Work Site Preparation, this Section. The designated area will be the laydown for materials receiving and storage during Construction.

- .2 The Contractor shall ensure, through treatment if required, that the staging site does not include any invasive species with the potential of being transported to within the National Parks.

### 2.2 WORK SITE PREPARATION

- .1 The Contractor shall prepare a safe landing area for helicopter at the Staging Area.
- .2 The Contractor shall construct four (4) permanent helipads at the work site which facilitate access for construction, operations and maintenance work on the RACS for the duration of their design life. Helipad designs will be stamped and signed by a qualified Professional Engineer registered to practice in BC, and conform to all relevant codes and regulations. Locations are subject to approval by the Departmental Representative.
- .3 The Contractor shall assess the work site and staging location for potential hazards including, but not limited to, unexploded ordnances (ANFO bags and cast primer), loose rock and dangerous trees. Only areas where work is undertaken need be surveyed.

- .4 **The Contractor shall perform a detailed ground survey for unexploded ordnances. There are no recorded unexploded ordnances in the Mount Bosworth paths.** The ground survey for unexploded ordnances shall be considered incidental to the work and no separate payment shall be made.
- .5 **The Contractor shall coordinate with PCA staff and ensure the safe removal from the site of any unexploded ordnances found before work commences.** Payment for removal of unexploded ordnances shall be made under “**Lump Sum Price Item 3 – Prime Cost Sum**”.
- .6 The Contractor shall remove loose rocks and dangerous trees from the work site that have potential to fall during activities associated with the installation process.
- .7 The Contractor shall carry out any necessary access construction, including but not limited to, trail building, scaling, access ropes, staging or platforms for workers, and supply of equipment and materials to facilitate RACS construction operations.
- .8 Disturbance to surrounding area shall be kept to a minimum; the Contractor shall remove only trees, vegetation and overburden where RACS are to be installed and at anchor locations in accordance with Section 01 35 43 - Environmental Procedures.

## 2.3 SUPPLY AND INSTALL ROCK BOLTS

- .1 If rock joints indicate that stabilization is required to stabilize areas of rock mass prior to RACS installation, the Contractor shall install rock bolts as per BC MoTI SS 206 and as directed by the Departmental Representative.

## 2.4 ANCHOR INSTALLATION

- .1 Anchor drilling, installation and grouting shall conform to BC MoTI SS 207 and the Drawings. The Contractor shall supply and place the grout required for the installation of the anchors. Any deviation from the use of grout for anchors shall be subject to the approval of the Departmental Representative.
- .2 The Contractor shall engage, at its own expense, an independent qualified ACI or ASA concrete technician with relevant experience to perform field and laboratory tests on grout. Quality control shall include, but not be limited to, observation of anchor grout batching and mixing operations, observation and testing/sampling during anchor grout placement. The Contractor shall submit daily anchor testing records and grouting sample forms to the Departmental Representative no later than one (1) day after testing on the anchor is completed. The Contractor shall submit the laboratory grout cube test results within two (2) days of the seven (7) day compressive strength test and within one week of the twenty-eight (28) day compressive strength testing.
- .3 Anchors shall be installed in the locations and at the orientations as shown in the Drawings or as directed by the Departmental Representative. Anchors shall be inspected by the Departmental Representative prior to installation of the RACS.
- .4 Epoxy resin may be used in the place of cementitious grout for the rock anchors provided that it has an equivalent life cycle and is approved for use for the environment and load conditions expected. An equivalent quality assurance program is required and must be approved by the Departmental Representative prior to the use of epoxy resin.

**2.5 REINFORCED CONCRETE FOUNDATION INSTALLATION**

- .1 The Contractor shall excavate, form and pour concrete foundations for RACS as per Contractor's Drawings and in accordance with manufacturer's specifications.
- .2 Foundations will be inspected by Departmental Representative prior to RACS assembly.

**2.6 RACS ASSEMBLY**

- .1 The Contractor shall assemble RACS in accordance with Contractor's Drawings and in accordance with instructions of RACS supplier.

**2.7 TECHNICAL ASSISTANCE**

- .1 The Contractor shall arrange for qualified and experienced technical representative of RACS supplier to be on site for initial stage of installation to ensure correct installation procedures. Arrange for a minimum of 2 additional visits during installation or as directed by Departmental Representative. Field report for each visit to be submitted to Departmental Representative.

**2.8 TESTING AND COMMISSIONING**

- .1 The Contractor shall arrange for qualified and experienced representative of RACS supplier to be on site for testing and commissioning of RACS once installation is complete.
- .2 The Contractor shall submit an outline of the testing and commissioning procedure to the Departmental Representative.

**2.9 TRAINING**

- .1 The Contractor shall arrange for qualified and experienced representative of RACS supplier to be on site for PCA staff training once testing and commissioning is complete.
- .2 The following minimum training is required by the Contractor:
  - .1 Training to 9 operational staff members and any other staff required to maintain the systems as designated by PCA, including electronics technicians, radio technicians, and information technologists, resulting in the trainees being capable of operating and maintaining the remote avalanche control system correctly, safely and efficiently.
  - .2 The Contractor shall include a site visit for each different type of RACS installed and will provide transportation for trainers and trainees to the site from the staging area.
- .3 The Contractor shall submit a detailed program of the training to be provided that includes but is not limited to:
  - .1 a schedule of training, hours of training that will be delivered
  - .2 topics that training will cover
  - .3 description of training materials/manuals
  - .4 any certifications that are required to operate the equipment

**2.10 SUPPORT**

- .1 The Contractor shall provide a list of support and service centers for the RACS in Canada, including which centers provide parts, consumables and repairs.

- .2 The Contractor shall outline a typical maintenance schedule provided by the RACS supplier. Annual maintenance is not included in this Contract and will be addressed separately by PCA at their discretion.

## **2.11 DOCUMENTATION**

- .1 The Contractor shall supply all necessary documentation for the RACS and their supporting software and infrastructure, including but not limited to permits, licenses, maintenance and operation manuals, and shop drawings for all design components, including but not limited to specifications and design drawings for consumables.
- .1 Maintenance and Operation Manual
  - .1 The Contractor shall prepare and submit a Maintenance and Operations Manual which will be used during the training of the PCA staff. This manual shall include but is not limited to the following:
    - .1 Equipment models and serial numbers;
    - .2 Procedures for inspections and maintenance;
    - .3 Procedures for operations;
    - .4 Safety requirements;
    - .5 Contact information for replacement parts and consumables;
    - .6 Shop drawings for all consumables;
    - .7 Contact information for service locations;
    - .8 Site access methods and plans;
    - .9 Troubleshooting;
    - .10 Schedules for inspections and maintenance.

**END OF SECTION**

## **Part 1 General**

### **1.1 DESCRIPTION OF WORK**

- .1 The Contractor shall prepare all finalization documentation to the standard and format noted or if no standard or format is noted, a professional standard and format of the kind typically provided in large federally funded projects of a similar technical nature, and submit them to the Departmental Representative for acceptance.
  - .1 Finalization documentation should be read to mean all documentation required under the Contract whether specifically noted as finalisation documentation or not. They may be, among other things, closeout submittals, drawings, manuals, records, reports, photographs, electronic files, samples, mock-ups, and anything else reasonably required by the Departmental Representative for the purpose of taking responsible ownership of the Works and finalising the Contract.

### **1.2 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 45 00 – Quality Control
- .3 Section 01 71 00 – Examination and Preparation
- .4 Section 01 77 00 – Closeout Procedures
- .5 Section 33 42 36 – Special Procedures Remote Avalanche Control Systems

**END OF SECTION**