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Drawings Revision 0:

<u>Sheet</u>	<u>Title</u>
C01	Cover Page
C02	Location Plan & Index
SP01	Signage Plan
S01-S03	Structural Drawings (3)

Reference Documents:

1. Directive 17 (*Best Management Practices for Construction Projects in Banff National Park*).

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 29 01 - Site Occupancy.
- .2 Section 01 33 00 - Submittal Procedures.

1.2 PROJECT LOCATION

- .1 The project is located in Banff National Park, Alberta. Sign installations are closely spaced at various locations along TransCanada Highway (TCH) near the east junction with Bow Valley Parkway (BVP). The following are key locations relative to the project:

Trans-Canada Highway 1 (TCH) km 0 – East Park Gate
TCH km17.1 – Norquay Interchange (west Banff entrance)
TCH km 20.3 to 23.3 - Sign Locations
TCH km 22.3 (BVP km 0) – Hwy 1A/Bow Valley Parkway Interchange
BVP km 0.3 – East Turnaround Site
TCH km 24.8 – Sunshine Road Interchange
TCH km 46 (BVP km 24.1) – Castle Mountain Interchange
TCH km 49.9 – Access Road to Mannix Pit

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Supply and install Dynamic Message Signs (DMS) including solar power equipment, base and pole assemblies, and all necessary non-dynamic signage material. Dynamic components will be added to existing guide signage by the Contractor.
- .2 Sites will require miscellaneous work such as traffic management, clearing, grubbing, stripping, trenching, backfilling, topsoiling and seeding as necessary.
- .3 In preparation for and during construction of this project, an “Environmental Protection Plan” (EPP) is to be prepared by the Contractor to meet the requirements of Section 01 35 43 – Environmental Procedures to ensure the desired minimal adverse effects are achieved. The Contractor’s EPP must be approved by Parks Canada Agency (PCA) prior to the commencement of construction. The Departmental Representative and Parks Canada’s environmental surveillance officer (ESO) will refer to the approved EPP in determining compliance with the plan and contract specifications. The EPP will form part of the contract.

1.4 CONTRACT METHOD

- .1 Construct Work under combined price contract.

1.5 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 Trans-Canada Highway paving. Contractor to be determined. Anticipated completion by Fall 2015.

□

- .2 Line painting at various location. Contractor is AAA Striping and Seal Coating Services. Anticipated contract completion is Fall 2015.
 - .3 Other maintenance and project work may occur along Trans-Canada Highway in 2015.
- .2 Where it is necessary that work is to proceed in areas of this project common to both the Contractor and forces of others, the Contractor shall cooperate with the other Contractors and the Owner in reviewing their construction schedules, sharing his work space, and shall coordinate his operations with the other Contractors, including traffic management and construction staging.
 - .3 Mannix Gravel Pit is an operational pit used by many contractors and Parks Canada. If access is required the Contractor shall gain authorization from the Departmental representative prior to entrance and use of the pit, and shall cooperate with the other users of the pit.

1.6 PRECEDENCE

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

1.7 DEFINITIONS

- .1 Alberta Transportation is referred to as "AT"

1.8 WORK SEQUENCE

- .1 Schedule work progress to allow Owner/Departmental Representative unrestricted access to inspect all phases of the Work.
- .2 Maintain fire and emergency access on TransCanada Highway and Bow Valley Parkway at all times.
- .3 **Complete all work by October 17, 2015 (Contract Completion Date).**

1.9 CONTRACTOR USE OF PREMISES

- .1 The Contractor is not permitted to extract and process native material for the production of granular aggregate anywhere inside the Park.
- .2 Contractor has unrestricted use of site subject to 1.9.1 above, Section 01 14 00 and Section 01 29 01 until the Contract Completion date.
- .3 Contractor shall limit use of premises for Work, for storage, and for access, to allow:
 - .1 Owner occupancy.
 - .2 Work by other Contractors.
- .4 Coordinate use of premises under direction of the Departmental Representative.
- .5 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

- .6 The Contractor and any Subcontractors shall obtain a business license from Realty Services in the Banff Park Administration building in Banff townsite, prior to commencement of the contract.
- .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 the Banff National Park Administration Building located at 101 Mountain Avenue, Banff, AB.

1.10 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.

1.11 OWNER FURNISHED ITEMS

The Contractor shall be responsible for the supply and installation of all materials required for the Work.

1.12 CONSTRUCTION SIGNAGE

- .1 No signs or advertisements, other than temporary warning and traffic control signs, are permitted on site.
- .2 Temporary signage shall meet or exceed requirements given by AT Traffic Accommodation in Work Zones (2008).
- .3 Signs and notices for safety and instruction shall be in both official languages. Signs shall be diamond grade and shall conform to CAN3-Z321.
- .4 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.
- .5 **All temporary traffic control signs, except for portable changeable message signs, that are used for longer than one day shall be mounted on wood posts.**

1.13 SETTING OUT OF WORK

- .1 Departmental Representative will establish control points and provide:
 - .1 Complete set of construction Drawings.
- .2 Contractor to:
 - .1 Set all work stakes necessary to complete work.
 - .2 Allow sufficient time for Departmental Representative to take measurements for payment.
 - .3 Not damage geodetic benchmarks or control monuments unless authorized by Departmental Representative.

- .3 No separate payment for setting out work, unless 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 Prime Cost Sum.

Part 1 Products

- .1 Not used.

Part 2 Execution

- .2 Not used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 35 31 - Special Procedures for Traffic Control.
- .2 Section 01 35 43 - Environmental Procedures.

1.2 ACCESS AND EGRESS

- .1 Provide for cyclist and vehicular traffic for the duration of the construction.

1.3 USE OF THE SITE AND FACILITIES

- .1 The Work Sites 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 The Contractor shall notify the Departmental Representative as soon as possible of any in-park facilities required for staging, storage, or camp accommodation, and an appropriate location will be identified for this use.
- .3 The Contractor shall not store material or park equipment along the Right-of-way outside the normal hours of work.
- .4 Contractor shall maintain adequate drainage at the Worksite.
- .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 **Work on Trans-Canada Highway in the National Parks is restricted between 07:00 hours and 22:00 hours, 7 days a week or as directed by the Departmental Representative.**
- .9 **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.**

Statutory and Civic Holidays:

- Family Day long weekend: From 07:00 AM. Friday, February 13, 2015 to 07:00 AM Tuesday, February 17, 2015.
- Good Friday long weekend: From 07:00 AM. Thursday, April 2, 2015 to 07:00 AM Tuesday, April 7, 2015.

- Victoria Day long weekend: From 07:00 AM. Friday, May 15, 2015 to 07:00 AM Tuesday, May 19, 2015.
- Canada Day: From 07:00 AM. Tuesday, June 30, 2015 to 07:00 AM Thursday, July 2, 2015.
- Civic Holiday long weekend: From 07:00 AM. Friday, July 31, 2015 to 07:00 AM Tuesday, August 4, 2015.
- Labour Day long weekend: From 07:00 AM. Friday, September 4, 2015 to 07:00 AM Tuesday, September 8, 2015.
- Thanksgiving Day long weekend: From 07:00 AM Friday, October 9, 2015 to 07:00 Tuesday, October 13, 2015.

1.4 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 EAEA prepared for the project.
- .5 The Contractor is responsible for the development and supply of construction access to the Work as approved by the Departmental Representative.

1.5 ACCESS TO ADJACENT PROPERTIES

- .1 Construction operations shall be conducted so as to cause minimal inconvenience to the public and to owners of adjoining property.

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 which may interfere with the Work. The Contractor shall co-operate with them at all times and in all places of Work. The Contractor shall keep the Departmental Representative informed of all communications with the Utility companies and authorities.
- .3 The Contractor shall notify the Departmental Representative and the Utility companies at least seven days in advance of any activities which 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 Sites and of properties on and adjoining the Work Sites 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 properties 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 Sites and of properties on or adjoining the Work Sites 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. 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.
- .5 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 properties within or adjacent to the Work Sites, whether all such properties are covered by the survey or not.

1.8 PROTECTION OF PERSONS AND PROPERTY

- .1 Comply with all applicable safety regulations of the Workers' Compensation Board of Alberta (WCB) including, but not limited to, WCB's Industrial Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations.
- .2 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Site.

- .3 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 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 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 which 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.
 - . The following personnel shall be included in the list:
 - .1 Project Superintendent;
 - .2 Safety Representative.
- .2 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 to approved sites outside Banff National Park. Refer to Section 01 35 43 - Environmental Procedures and 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

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Prime Cost Sum.
- .2 Measurement procedures.

1.2 REFERENCES

- .1 General Conditions.

1.3 PRIME COST SUM

- .1 Include in Contract Price a total Prime Cost Sum of **\$20,000.00**.
- .2 Do not include in the Contract Price, additional contingency allowances for products, installation, overhead or profit.
- .3 Prime Cost Sum provided for in the unit price table is not a sum due the Contractor. Rather, payment will be made against it for miscellaneous work not included in the unit price table under the General Conditions of the Contract.
- .4 Such work may include, but not be limited to:
 - .1 Relocation or removal and disposal of existing signs, guardrail, guide posts and other miscellaneous items;
 - .2 Supply and install Dynamic Message Signs (DMS) including solar power equipment, base and pole assemblies, and all necessary non-dynamic signage material;
 - .3 Supply and install Dynamic components;
 - .4 Supply and installation of permanent signs (not construction signs);
 - .5 Supply and installation guide posts;
 - .6 Additional clearing and grubbing;
 - .7 Additional stripping;
 - .8 Additional trenching;
 - .9 Supply and placement of backfill material;
 - .10 Supply and installation of seeding;
 - .11 Supply, testing and placement of topsoil;
 - .12 Stripping, excavation and disposal of waste materials as directed by the Departmental Representative;
 - .13 Remediation or removal and replacement of unsuitable or contaminated soils not described in the contract documents;
 - .14 Traffic Management;
 - .15 Site occupancy.

- .5 The Contract Price, and not Prime Cost Sum, includes Contractor's overhead and profit in connection with the Work.

1.4 MEASUREMENT PROCEDURES

- .1 Payment for Work under the **“Lump Sum Price Item 3) - Prime Cost Sum”** will be made using negotiated rates or by material, labour and equipment rates as per the following:
 - .1 Rental rates will be in accordance with current Alberta Roadbuilders and Heavy Construction Association rate schedule, 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.
 - .3 Transportation time to and from site will be reimbursed only for equipment used exclusively for additional work.

Part 2 Products

- .1 Not used.

Part 3 Execution

- .1 Not used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Mobilization and Demobilization.

1.2 RELATED SECTIONS

- .1 Section 01 11 00 – Summary of Work

1.3 DESCRIPTION

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

1.4 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 is complete.
 - .3 The remainder of the Lump Sum Price for Mobilization and Demobilization to be paid after Contract Completion and the site has been 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

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Definition of Site Occupancy and Bidding Method.

1.2 PRECEDENCE

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

1.3 RELATED SECTIONS

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

1.4 DEFINITION OF OCCUPANCY

- .1 OCCUPANCY
- .1 Notwithstanding SACC R2850D - GC 5.10, the Contractor shall be permitted to lease and occupy sites where he will be working in Banff National Park, free of charge from the date of award of the contract up to and including the completion date of **October 17, 2015** (Section 01 11 00 – Summary of Work Clause 1.10 - Work Sequence). The sites to be leased by the Contractor include all the roads and areas specified in this contract and as directed by the Departmental Representative.
- .2 The Contractor's occupancy of the site will be deemed to have ended, when both of the following conditions are met to the satisfaction of Parks Canada:
- All the work identified under this contract, has been completed.
 - All sites clean up and any outstanding deficiencies have been addressed 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 SECTION INCLUDES

- .1 Coordination.
- .2 Progress meetings.
- .3 Construction organization and start-up.
- .4 Submittal schedule.
- .5 Construction progress meetings.
- .6 On-site documents.
- .7 Schedules.
- .8 Submittals.
- .9 Close out procedures.

1.2 RELATED SECTIONS

- .1 Section 01 11 00 - Summary of Work.
- .2 Section 01 14 00 – Work Restrictions.
- .3 Section 01 33 00 - Submittal Procedures.
- .4 Section 01 35 43 - Environmental Procedures.
- .5 Section 01 45 00 – Quality Control.
- .6 Section 01 52 00 - Construction Facilities.
- .7 Section 01 77 00 – Close out Procedures.
- .8 Section 01 78 00 – Close out Submittals.

1.3 MEASUREMENT PROCEDURES

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

1.4 COORDINATION

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

1.5 PROJECT MEETINGS

- .1 Attend project meetings throughout progress of Work and provide information as determined by the Departmental Representative. Meetings shall be chaired by the Departmental representative who will prepare the minutes of the meetings.

- .2 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 Provide physical space and make arrangements for meetings.

1.6 CONSTRUCTION ORGANIZATION AND START-UP

- .1 Within seven (7) days after award of Contract, request a meeting of Contract Representatives to discuss and resolve administrative procedures and responsibilities. Meeting shall be chaired by the Departmental representative who will prepare the minutes of the meeting.
- .2 Senior representatives of the Owner, Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.
- .3 Agenda to include following:
 - .1 Appointment of official representative of participants in Work.
 - .2 Schedule of Work.
 - .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 Comply with Departmental Representative's allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
- .5 During construction, coordinate use of site and facilities through Departmental Representative's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of Drawings, recommendations, and resolution of ambiguities and conflicts.
- .6 Comply with instructions of the Departmental Representative for use of temporary utilities and construction facilities.
- .7 Coordinate field engineering and layout work with the Departmental Representative.

1.7 ON-SITE DOCUMENTS

- .1 Maintain at 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.

1.8 SUBMITTAL SCHEDULE

- .1 Prepare a schedule of the required submissions and the date the submissions will be made. Include columns for Actual Date of Submission, Review Comments Received, Final Submission and Final Acceptance Received.
- .2 Approval by the Departmental Representative of the Contractor's Safety Plan and Traffic Management Plan are required before any other Work may proceed and should be scheduled accordingly.
- .3 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.

1.9 PROJECT SCHEDULES

- .1 Submit preliminary construction progress schedule to Departmental Representative
- .2 During progress of Work revise and resubmit as directed by the Departmental Representative.
- .3 In addition to the project schedule, submit weekly schedules to the Departmental Representative showing Work planned for the following week.

1.10 CONSTRUCTION PROGRESS MEETINGS

- .1 During course of Work prior to project completion, schedule progress meetings as required by Departmental Representative.

- .2 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.
- .3 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.

1.11 SUBMITTALS

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

1.12 CLOSEOUT PROCEDURES

- .1 Notify Departmental Representative when Work is considered ready for Substantial Performance.

- .2 Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Departmental Representative's instructions for correction of items of Work listed in executed certificate of Substantial Performance.
- .4 Notify Departmental Representative of instructions for completion of items of Work determined in Departmental Representative's final inspection.

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 35 31 - Special Procedures for Traffic Control.
- .3 Section 01 35 29.06 – Health and Safety Requirements.
- .4 Section 01 35 43 - Environmental Procedures.
- .5 Section 01 45 00 – Quality Control.
- .6 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 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.
- .5 Notify Departmental Representative in writing at time of submission, identifying any deviations from requirements of Contract Documents stating reasons for deviations.
- .6 Verify field measurements and affected adjacent Work is consistent.
- .7 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .9 Keep one reviewed copy of each submission on site.

1.4 “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 which 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 seven (7) calendar days for Departmental Representative’s review of each submission.
- .6 Adjustments made on shop drawings by the Departmental Representative are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Departmental Representative prior to proceeding with the Work.
- .7 Make changes in shop drawings as the Departmental Representative may require, consistent with the Contract Documents. When resubmitting, notify the Departmental Representative in writing of any revisions other than those requested.
- .8 Submit letter(s) of certification with all mix designs.
- .9 Accompany submissions with a transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor’s name and address.
 - .4 Identification and quantity of each shop drawing, mix design, product and sample.
 - .5 Other pertinent data.
- .10 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:

- Subcontractor,
 - Supplier,
 - Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with the Contract Documents.
- .5 Details of appropriate portions of the Work as applicable:
- Fabrication,
 - Performance characteristics,
 - Standards.
- .11 After the Departmental Representative's review, distribute copies.
- .12 Submit one (1) electronic copy of the shop drawings or mix design for each requirement requested in the Specification Sections as requested by the Departmental Representative.
- .13 Submit one (1) electronic copy of the product data sheets or brochures for requirements requested in the Specification Sections as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of the product.
- .14 Delete information not applicable to project.
- .15 Supplement standard information to provide details applicable to project.
- .16 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .17 The review of shop drawings and mix designs by Departmental Representative is for the sole purpose of ascertaining conformance with general concept. This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.5 SAMPLES

- .1 Not used.

1.6 MOCK-UPS

- .1 Not used.

1.7 CERTIFICATES AND TRANSCRIPTS

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

1.8 REQUIRED CONTRACTOR SUBMITTALS

- .1 General

- .1 This Clause identifies the plans, programs, and documentation required prior to mobilization on site and during the construction phase.

- .2 Pre-Mobilization Submittals

The Contractor shall 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 seven (7) days prior to mobilization to the project site:

- .1 Project schedule, detailing the schedule of the workdays required from Contractor, subcontractors, suppliers and consultants to complete each activity of the project by road segment or location in order to meet stages specified in Section 01 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.
- .2 List of subcontractors, suppliers and consultants, their role and their key personnel, including names and positions, addresses, telephone, cellular telephone and/or pager numbers, as requested by Departmental Representative .
- .3 Plan describing methods the Contractor will have to meet his responsibilities as the Prime Contractor for Traffic Control in the Work zones.
- .4 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.
- .5 Quality Control Plan in accordance with Section 01 45 00 – Quality Control.
- .6 Traffic Management Plan, in accordance with the requirements of Section 01 35 31 - Special Procedures for Traffic Control.
- .7 EPP that shall meet the requirements of Section 01 35 43 – Environmental Procedures.

- .8 Management of Owner supplied materials Plan describing the Contractor's intended methods of reporting to him regularly on quantities used and for what purpose, and on managing materials supplied by the Owner to avoid waste or shortfalls.
- .9 Survey Plan describing the Contractor's intended methods of surveying during this project.
- .10 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.
- .11 Health And Safety Plan - The Contractor shall have a Certificate of Recognition (COR) or Registered Safety Plan (RSP) including a site specific Health and Safety Plan acceptable to the Departmental Representative. The Contractor shall implement and maintain the Health and Safety Plan during the Work.
- .12 Health and Safety Plan must include:
 - Contractor's safety policy.
 - Identification of applicable compliance obligations.
 - Definition of responsibilities for project safety/organization chart for project.
 - Site specific hazard assessment.
 - General safety rules for project.
 - Job specific safe work procedures.
 - Inspection policy and procedures.
 - Incident reporting and investigation policy and procedures.
 - Occupational Health and Safety meetings.
 - Occupational Health and Safety communications and record keeping procedures.
 - Results of safety and health risk or hazard analysis for site tasks and operation.
 - Submit copies of Material Safety Data Sheets (MSDS).
 - 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.
 - On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
 - The Contractor shall not begin any site Work until the Departmental Representative has authorized acceptance of the submittals in writing.
- .3 Construction Phase Submittals

- .1 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. Work to be linked to activities by road segment or location identified in project schedule and to provide information on materials, equipment and manpower. Also, alternate Work to be identified if Work or a portion of, proposed cannot be done due to weather, equipment breakdown, delays in delivery, etc.
- .2 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.
- .3 “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 of 7 days prior to fabrication / production.
- .4 Progress Photographs:
 - Formats:
 - .1 Electronic: .jpg files, minimum three (3) mega pixels.
 - Submission requirements: one (1) set of electronic files.
 - Identification: Name and number of project, description of photograph and date.
 - 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 CD with all electronic pictures as part of closeout package.
 - .7 Submit an electronic copy of Contractor’s authorized representative’s work site health and safety inspection reports to Departmental Representative and authority having jurisdiction as requested by Departmental Representative.
 - .8 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
 - .9 Submit copies of incident and accident reports.
- .4 Project Completion Submittals
 - .1 Record Drawings -The Contractor shall submit copies of all Contractor's Drawings revised as necessary to record all as-built changes to the Work

and the Contractor shall submit a set of Contract Drawings clearly marked to record as-built changes to the Work.

- .2 Quality Control Records – The Contractor shall submit a bound and itemized set of project quality control documentation.
- .5 The Contractor shall not construe the Departmental Representative’s authorization of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Authorization of the programs shall not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal or Provincial regulations, 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 SECTION INCLUDES

- .1 Submittals.
- .2 Filing of notice.
- .3 Safety assessment.
- .4 Meetings.
- .5 Regulatory requirements.
- .6 General requirements.
- .7 Responsibility.
- .8 Compliance requirements.
- .9 Unforeseen hazards.
- .10 Health and safety coordinator.
- .11 Posting of documents.
- .12 Correction of non-compliance.
- .13 Work stoppage.

1.2 RELATED SECTIONS

- .1 Section 01 14 00 – Work Restrictions
- .2 Section 01 33 00 – Submittal Procedures
- .3 Section 01 35 43 - Environmental Procedures
- .4 Section 02 61 33 - Hazardous Materials: Submission Requirements for WHMIS MSDS.

1.3 MEASUREMENT PROCEDURES

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

1.4 REFERENCES

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

1.5 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 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:
 - Contractor's safety policy.
 - Identification of applicable compliance obligations.
 - Definition of responsibilities for project safety/organization chart for project.
 - General safety rules for project.
 - Job specific safe work procedures.
 - Inspection policy and procedures.
 - Incident reporting and investigation policy and procedures.
 - Occupational Health and Safety meetings.
 - Occupational Health and Safety communications and record keeping procedures.
 - Results of site specific safety hazard assessment.
 - Results of safety and health risk or hazard analysis for site tasks and operation.
 - Submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.
 - Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
 - Submit copies of incident and accident reports.
 - Submit copies of Material Safety Data Sheets (MSDS) to Departmental Representative.
 - 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.

- 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.
- 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.
- On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.6 FILING OF NOTICE

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

1.7 SAFETY ASSESSMENT

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

1.8 MEETINGS

- .1 Schedule and administer 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.

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.

A copy of the "Attestation and Proof of Compliance with Occupational Health and Safety (OHS)" form is attached as Appendix A.

1.9 REGULATORY REQUIREMENTS

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

1.10 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.11 RESPONSIBILITY

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

1.12 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta and British Columbia when working in that province.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.13 UNFORESEEN HAZARDS

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

1.14 HEALTH AND SAFETY COORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Co-coordinator must:
 - Have minimum 2 years site-related working experience specific to activities associated with roadway construction.
 - Have working knowledge of occupational safety and health regulations.
 - 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.
 - Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.15 POSTING OF DOCUMENTS

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

1.16 CORRECTION OF NON-COMPLIANCE

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

1.17 WORK STOPPAGE

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

Part 2 Products

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

1.3 MEASUREMENT PROCEDURES

- .1 Cost of Traffic Control, including temporary pavement marking, described in this Section 01 35 31, 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. The Contractor shall receive payment for traffic management on a monthly basis prorated by the number of months working on site divided by the number of months on site identified on Contractor schedule, not to exceed the total lump sum bid price for Traffic Management.
- .2 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 Alberta Transportation - Traffic Accommodation in Work Zones.
 - .2 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 the requirements of the current edition of the AT - Traffic Accommodation in 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 design, supply, erect, move and maintain all traffic control devices, signs, temporary pavement marking, and 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.

- .3 All temporary signs that are used for longer than one day shall be mounted on wood posts.
- .4 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 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.
- .5 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.
- .6 Temporary pavement marking shall be in accordance with Section 32 17 23 – Pavement Marking
- .7 Contractor shall have appropriate traffic control measures in place so that at least one lane measuring 3.7m wide of highway traffic is maintained through the work zone at all times throughout the construction.
- .8 The Contractor shall coordinate traffic management procedures with other Contractors working in the area.

1.7 PROTECTION OF PUBLIC TRAFFIC

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 When working on existing travelled way:
 - .1 Place equipment in a position presenting a minimum of interference and hazard to traveling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
 - .3 Do not leave equipment on travelled way overnight.
- .3 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 AT - Traffic Accommodation in Work Zones, except where specified otherwise.
- .4 Keep travelled way clean, free of pot holes and of sufficient width to accommodate at least one 3.7 m wide lane for traffic.
- .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, safety of traveling public and coordination with adjacent contracts.

- .7 Traffic control measures will be monitored by the Departmental Representative, who may require modifications of these measures from time to time to achieve satisfactory traffic flow, safety of traveling public and coordination with adjacent contracts

1.8 INFORMATIONAL AND WARNING DEVICES

- .1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in the Traffic Management Plan submitted by the Contractor and approved by the Departmental Representative. **Except for portable changeable message signs, all temporary signs that are used for longer than one day shall be mounted on wood posts.**
- .3 Place signs and other devices to standards and in locations recommended in AT - Traffic Accommodation in Work Zones.
- .4 Signs shall be wind resistant.
- .5 As 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:
 - .1 Checking signs daily for legibility, damage, suitability and location.
 - .2 Cleaning, repairing or replacing signs as required ensuring clarity and reflectance.
 - .3 Removing or covering signs which do not apply to conditions existing from day to day or time to time.

1.9 CONTROL OF PUBLIC TRAFFIC

- .1 Provide competent flag persons, trained in accordance with, and properly dressed and equipped as specified in, Alberta Transportation - Traffic Accommodation in Work Zones:
 - .1 When public traffic is required to pass working vehicles or equipment, which block all or part of travelled roadway.
 - .2 When vehicles are entering or exiting Worksite access points.
 - .3 When vehicles are entering or exiting gravel pits in the park.
 - .4 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .5 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

- .6 Where temporary protection is required while other traffic control devices are being erected or taken down.
- .7 For emergency protection when other traffic control devices are not readily available.
- .8 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
- .2 Delays to public traffic due to Contractor's operators: maximum 3 minutes.
- .3 Hours of Work and stoppage of traffic are restricted as provided in Section 01 14 00 – Work Restrictions.

1.10 OPERATIONAL REQUIREMENTS

- .1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified herein and approved by Departmental Representative to protect and control public traffic, existing conditions for traffic to be restricted as follows:
 - .1 Speed limit maintained at 90 km/h (TCH) or 60km/h (BVP) in work zones in non-work periods.
 - .2 Speed limit reduced to 50 km/h in work zones in work periods.
- .2 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 SECTION INCLUDES

- .1 Measurement procedures.
- .2 National Park regulations.
- .3 Canadian Environmental Assessment Act (CEAA).
- .4 Start-up and environmental briefing.
- .5 Site access and parking.
- .6 Protection of work limits.
- .7 Erosion control.
- .8 Pollution control.
- .9 Equipment maintenance, fuelling and operation.
- .10 Operation of equipment.
- .11 Fire prevention and control.
- .12 Wildlife.
- .13 Relics and antiquities.
- .14 Waste materials storage and removal.
- .15 Miscellaneous site management contingencies.
- .16 Clearing and grubbing.
- .17 Stripping.
- .18 Material loading, hauling, placement and grade building.
- .19 Excavating and placement.
- .20 Culvert installation.
- .21 Asphalt plant operation and paving.
- .22 Crushing.
- .23 Fine grading, topsoil placement and seeding.
- .24 Pavement marking.
- .25 Specific concerns.

1.2 RELATED SECTIONS

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

1.3 MEASUREMENT PROCEDURES

- .1 Preparation and implementation of an Environmental Protection Plan (EPP) 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.

1.4 SUBMITTALS

- .1 The Contractor is required to prepare an Environmental Protection Plan in accordance with this Section 01 35 43 – Environmental Procedures, Directive 17 (*Best Management Practices for Construction Projects in Banff National Park*), and other relevant specifications provided by the Departmental Representative.

1.5 NATIONAL PARK REGULATIONS

- .1 The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
- .2 The Contractor and any sub-Contractors shall obtain a business license from the Parks Canada Administration Office in Banff or 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 Banff National Park Administration Building at 101 Mountain Avenue, Banff, AB during regular business hours.

1.6 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 2012, subsequent amendments, and Parks Canada's Interim Directive on Implementation of the Canadian Environmental Assessment Act 2012.
- .2 Failure to comply with or observe environmental protection measures as identified in these specifications may result in charges under the Canadian Environmental Assessment Act and/or the work being suspended pending rectification of the problems.

1.7 START-UP AND ENVIRONMENTAL BRIEFING

- .1 All staff employed at the construction site must attend a briefing regarding their individual and collective responsibilities to ensure adverse environmental impacts do not arise from their activities and personal choices. **All employees must attend this briefing before beginning their work at the site.** Parks Canada shall maintain a record of employees who have completed this briefing. It is recognized 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.

1.8 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.

1.9 PROTECTION OF WORK LIMITS

- .1 The Contractor is to prepare an EPP which 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.

1.10 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.

1.11 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 Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The Departmental Representative and the ESO shall be notified immediately of any spill. If not available, Banff Dispatch will be contacted at (403) 762 – 4506. Spill response cards will be distributed during the initial Environmental Briefing with basic instructions and phone numbers.
- .8 In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- .9 The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Contractor.

The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Departmental Representative and ESO.

1.12 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 is removed (e.g. power washing) outside of Banff 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 Banff 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 Banff National Park. Alternatively, the Contractor may hire a security person employed to prevent vandalism.

1.13 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.

1.14 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. It is recommended that basic firefighting equipment (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) 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 and will depend on the timing of the contract (e.g. – not required during winter or snow covered conditions). A water source for the truck will be identified by the Departmental Representative.
- .3 Construction equipment shall be operated in a manner and with all original manufacturer's safety devices to prevent ignition of flammable materials in the area.
- .4 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented. Fires or burning of waste materials is not permitted.
- .5 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The ESO and the Departmental Representative shall be notified of any fire immediately. If not available, Banff Dispatch shall be contacted at (403) 762 – 4506.
- .6 Fires or burning of waste materials is not permitted.

1.15 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 Construction activities will take place during daylight hours and, and if necessary, the construction activity may be scheduled around important wildlife windows (e.g. Harlequin duck breeding and bird nesting). Fisheries windows for avoidance of stream disturbance work will apply – see Fish and Fish Habitat Considerations section below.
- .3 All site workers will observe posted speed limits and 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. The contractor will ensure that the work site is properly secured during non-work hours with excavations fenced and covered as required to prevent injury to wildlife.
- .4 Notify the ESO and Departmental Representative immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the site or crew accommodation. Other wildlife-related encounters are to be reported within 24 hours. If the ESO or Departmental Representative are not available, Banff Dispatch will be contacted at (403) 762 – 4506.

1.16 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 Banff 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.

1.17 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 Banff 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 Banff 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. If neither can be reached, the Contractor/worker shall immediately contact Banff Dispatch at (403) 762 – 4506 and report the details.
- .7 Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition.

1.18 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES

- .1 The Contractor shall prepare an EPP which 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 If required, a Contractor's office and work headquarters material laydown, equipment parking and storage area will be permitted at a location identified by the Departmental Representative.
- .3 If required, a workers accommodation camp location will be confirmed and designated by the Departmental Representative. No equipment, materials lay-down area or fuel storage is permitted at this location.
- .4 If the Contractor chooses to provide a Workers Accommodation camp, then the Contractor shall prepare a Workers Accommodation Camp Plan regarding structures, layout, vehicles, operations, etc. required at this location, to the satisfaction of the Departmental Representative. Particular attention shall be given to management of foods and waste products attractive to wild animals. An electric surround fence may be required in the event of bear attraction problems. The site may be shared with other Contractors. All ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations shall apply (e.g. no excessive noise, quiet times, no fires, etc.). The Contractor shall provide toilets and maintain them in a clean and sanitary condition at the camp. These facilities shall not be used for the disposal of anything but human body wastes.
- .5 The National Park Act regulations prohibit anyone working within Banff National Park from using public campground facilities.

- .6 Removal and storage of snow shall be arranged with the ESO and the Departmental Representative.
- .7 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.
- .8 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.
- .9 Pets shall not be brought to or maintained at the construction site or worker's camp.
- .10 Should the Contractor require/request a water source, the Departmental Representative, in consultation with the ESO will give direction as to a 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 During the grubbing component, stumps, roots, imbedded logs and other non-soil debris shall be pulled and shaken free of loose soil and rocks before transport to a disposal site designated by the ESO or Departmental Representative.
- .6 No slash clearing, pickup or grubbing shall occur outside of the designated area or within 1 metre of the drip line of existing forest.

- .7 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 the 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 FINE GRADING, TOPSOIL PLACEMENT, AND SEEDING

- .1 This contract involves the final shaping of cut slopes, fills and landscapes disturbed in the construction of the Works. These slopes will be covered by stripped soil and chip compost materials and seeded. Environmental concerns related to these activities largely focus on erosion prevention and sediment control. The Contractor is to present a plan for placement, spreading, and stabilization of reclamation materials that controls erosion and prevents sedimentation, to the satisfaction of the Departmental Representative and E.S.O.

3.4 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.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Measurement procedures.
- .2 Testing by the Contractor.
- .3 Contractor' Quality Control Program.
- .4 Inspection.
- .5 Independent Inspection Agencies.
- .6 Access to Work.
- .7 Reports.
- .8 Tests and mix designs.
- .9 Mill tests.

1.2 RELATED SECTIONS

- .1 All Division 01, 02 and 03 Sections

1.3 MEASUREMENT PROCEDURES

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

1.4 REFERENCES

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

1.5 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:
 - testing all structural concrete, grout, reinforcing steel, asphalt concrete pavement, structural backfill, corrugated steel culverts, misc metals, concrete barriers, and all source acceptance testing;
 - all testing specified in the Contract Documents; and
 - any other testing required as a condition for deviation from the specified Contract procedures.
- .2 Testing proposed shall be based on testing requirements as stated in the 2013 AT Standard Specifications for Highway Construction or as stated below, whichever is more stringent.
- .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:

- 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;
 - notify the Departmental Representative when sampling will be conducted;
 - submit test results to the Departmental Representative within one Day after completion of testing; and
 - 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

1.6 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 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.
- .3 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.

1.7 INSPECTION

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

1.8 INDEPENDENT INSPECTION AGENCIES

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

1.9 ACCESS TO WORK

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

1.10 PROCEDURES

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

1.11 REJECTED WORK

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

1.12 REPORTS

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

1.13 TESTS AND MIX DESIGNS

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

1.14 MILL TESTS

- .1 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 SECTION INCLUDES

- .1 Installation and removal.
- .2 Site storage/loading.
- .3 Construction parking.
- .4 Security.
- .5 Offices.
- .6 Equipment, tools and material storage.
- .7 Sanitary facilities.
- .8 Construction signage.

1.2 RELATED SECTIONS

- .1 Section 01 35 31 - Special Procedures for Traffic Control.

1.3 MEASUREMENT PROCEDURES

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

1.4 INSTALLATION AND REMOVAL

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

1.5 SITE STORAGE/LOADING

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

1.6 CONSTRUCTION PARKING

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

1.7 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

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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.

1.8 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

1.9 SANITARY FACILITIES

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

1.10 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 offsite 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 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 35 31 - Special Procedures for Traffic Control.
- .2 Section 01 52 00 - Construction Facilities.

1.4 INSTALLATION AND REMOVAL

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

1.5 FENCING

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

1.6 GUARD RAILS AND BARRICADES

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

1.7 WEATHER ENCLOSURES

- .1 Not used.

1.8 DUST TIGHT SCREENS

- .1 Not used.

1.9 ACCESS TO SITE

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

1.10 PUBLIC TRAFFIC FLOW

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

1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

1.12 PROTECTION OF BUILDING FINISHES

- .1 Not used.

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 .Not Used

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Quality.
- .2 Availability.
- .3 Storage, handling and protection.
- .4 Transportation.
- .5 Manufacturer's instructions.
- .6 Quality of work.
- .7 Coordination.
- .8 Concealment.
- .9 Remedial work.
- .10 Fastenings.
- .11 Protection of work in progress.

1.2 RELATED SECTIONS

- .1 Section 01 45 00 - Quality Control.

1.3 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.

1.4 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.

1.5 AVAILABILITY

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

1.6 STORAGE, HANDLING AND PROTECTION

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

1.7 TRANSPORTATION

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

1.8 MANUFACTURER'S INSTRUCTIONS

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

1.9 QUALITY OF WORK

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

1.10 CO-ORDINATION

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

1.11 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.

1.12 REMEDIAL WORK

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

1.13 FASTENINGS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.

- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.14 PROTECTION OF WORK IN PROGRESS

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

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Qualifications of Surveyor.
- .2 Survey reference points.
- .3 Survey / layout requirements.
- .4 Survey accuracy.
- .5 Notification.
- .6 Records Submittals.

1.2 MEASUREMENT PROCEDURES

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

1.3 REFERENCES

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

1.4 QUALIFICATIONS OF SURVEYOR

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

1.5 SURVEY / LAYOUT REQUIREMENTS

- .1 The Departmental Representative will indicate the beginning and end of the project and sufficient reference points and other information for horizontal and vertical control, to be used by the Contractor for his detailed layout. This information will include, if available, radii and lengths of curves, design superelevations, pavement widths, and centreline deflection points. 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.

1.6 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points will be provided by the Departmental Representative.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.

- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.7 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 Reference Survey Control Points that are in danger of being damaged or destroyed.
- .2 Departmental Representative will review/approve all measurement surveys.

1.8 RECORDS

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

1.9 SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, 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 SECTION INCLUDES

- .1 Progressive cleaning.
- .2 Final cleaning.

1.2 PRECEDENCE

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

1.3 MEASUREMENT PROCEDURES

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

1.4 RELATED SECTION

- .1 Section 01 35 31 - Special Procedures for Traffic Control.
- .2 Section 01 35 43 - Environmental Procedures.
- .3 Section 01 77 00 - Closeout Procedures.

1.5 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 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.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Remove waste material and debris from site at end of each working day.
- .6 Dispose of waste materials and debris off site.
- .7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .8 Provide adequate ventilation during use of volatile or noxious substances.
- .9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.6 FINAL CLEANING

- .1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

□

- .2 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .3 Remove waste products and debris including that caused by Owner or other Contractors.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Inspect finishes, and ensure specified workmanship and operation.
- .7 Remove dirt and other disfiguration from exterior surfaces.
- .8 Sweep and wash clean paved areas.
- .9 Clean drainage systems.

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Inspection and declaration.

1.2 PRECEDENCE

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

1.3 MEASUREMENT PROCEDURES

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

1.4 RELATED SECTIONS

- .1 Section 01 74 11 - Cleaning.
- .2 Section 01 78 00 - Closeout Submittals.

1.5 INSPECTION AND DECLARATION

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

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Section 01 77 00

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Parks Canada Agency

Long Term Signage Plan
Banff National Park

CLOSEOUT
PROCEDURES
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Part 2 **Products**
 .5 Not Used.

Part 3 **Execution**
 .6 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 45 00 - 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 RECORDING ACTUAL SITE CONDITIONS

- .1 Contractor to provide as built drawings to Departmental Representative at project completion.
- .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
 - .4 References to related shop drawings and modifications.
- .4 Specifications: legibly mark each item to record actual construction, including:
 - .1 Changes made by Addenda and change orders.

1.6 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.

1.7 WARRANTIES AND BONDS

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

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Definitions.
- .2 Submittals.
- .3 Storage and handling.
- .4 Transportation.
- .5 Materials.
- .6 Disposal.

1.2 PRECEDENCE

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

1.3 MEASUREMENT PROCEDURES

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

1.4 RELATED SECTIONS

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

1.5 REFERENCES

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

1.6 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 01 33 00 - 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 STORAGE AND HANDLING

- .1 Coordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
- .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
- .3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.
- .4 All explosives must be mixed outside of the Park and delivered to the site. No storage of explosives shall be allowed within the National Parks.
- .5 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.
- .6 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers which are in good condition.
 - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
 - .4 Segregate incompatible materials and wastes.
 - .5 Ensure that different hazardous materials or hazardous wastes are not mixed.
 - .6 Store hazardous materials and wastes in a secure storage area with controlled access.
 - .7 Maintain a clear egress from storage area.

- .8 Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.
- .9 Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.
- .10 Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .7 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .8 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

1.9 TRANSPORTATION

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

- .9 Report any discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

Part 2 Products

2.2 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 for which 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:
 - .1 Hazardous wastes recycled in manner constituting disposal.
 - .2 Hazardous waste burned for energy recovery.
 - .3 Lead-acid battery recycling.
 - .4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Measurement procedures.
- .2 Shop drawings.
- .3 Waste management and disposal.
- .4 Materials.
- .5 Fabrication and erection.
- .6 Removal and reshoring.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 43 - Environmental Procedures.
- .3 Section 03 30 00 - Cast-in-Place Concrete.

1.3 MEASUREMENT PROCEDURES

- .1 This work will not be measured for payment. Include costs in Unit Price Items for which concrete formwork and falsework is required.

1.4 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CSA-A23.1-[04]/A23.2-[04], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-O86S1-[05], Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
 - .3 CSA O121-[M1978(R2003)], Douglas Fir Plywood.
 - .4 CSA O151-[04], Canadian Softwood Plywood.
 - .5 CSA O153-[M1980(R2003)], Poplar Plywood.
 - .6 CSA O437 Series-[93(R2006)], Standards for OSB and Waferboard.
 - .7 CSA S269.1-[1975(R2003)], Falsework for Construction Purposes.
 - .8 CAN/CSA-S269.3-[M92(R2003)], Concrete Formwork, National Standard of Canada
- .2 Council of Forest Industries of British Columbia (COFI)
 - .1 COFI Exterior Plywood for Concrete Formwork.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit drawings stamped and signed by Professional Engineer registered or licensed in Province of Alberta, Canada.
- .2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework Drawings. Comply with CAN/CSA-S269.3 for formwork Drawings.
- .3 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.
- .4 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 35 43, Environmental Procedures.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low volatile organic compounds (VOC's).
- .5 Dispose concrete waste in the roadway embankment as approved by the Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 Forms for exposed surfaces including the cast in place concrete shall be new material, made of "Coated Formply", consisting of Douglas Fir substrate with resin-impregnated paper overlay and factory treated chemically active release agent,
 - .2 Acceptable products:
 - .3 "ULTRAFORM",
 - .4 "POURFORM 107",
 - .5 Or equal.
 - .6 All form material for exposed surfaces shall be full-sized sheets, as practical. The re-use of any forms must have the acceptance of the Departmental Representative.
- .2 The minimum acceptable forming for all exposed concrete where the pour height is 1.5 m or less shall have 18 mm approved plywood, supported at 300 mm maximum on

centres. Where the pour height is greater than 1.5 m the minimum acceptable forming for all exposed concrete shall have 18 mm approved plywood, supported at 200 mm maximum on centres. Strong-backs or walers placed perpendicularly to the supports shall be employed to ensure straightness of the form.

- .3 Metal bolts or anchorages within the forms shall be so constructed as to permit their removal to a depth of at least 20 mm from the concrete surface.
- .4 Break-back type form ties shall have all spacing washers removed and the tie shall be broken back a distance of at least 20 mm from the concrete surface.
- .5 All fittings for metal ties shall be of such design that, upon their removal, the cavities which are left will be of the smallest possible size. Torch cutting of steel hangers and ties will not be permitted. Formwork hangers for exterior surfaces of decks and curbs shall be an acceptable break-back type with surface cone, or removable threaded type.
- .6 Cavities shall be filled with cement mortar and the surface left sound, smooth, even and uniform in color.
- .7 Form release agent shall be non-toxic, biodegradable, low VOC.
- .8 Falsework materials to CSA-S269.1.

Part 3 Execution

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with Drawings.
- .2 Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.
- .3 Do not place shores and mud sills on frozen ground.
- .4 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .5 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.
- .6 Align form joints and make watertight. Keep form joints to minimum.
- .7 Use 20 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

3.2 REMOVAL AND RESHORING

- .1 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

- .2 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .3 Reuse formwork and falsework subject to requirements of CAN/CSA-A23.1.

END OF SECTION

Part 1 General

1.1 DESCRIPTION OF WORK

- .1 The Work covered in this specification includes the construction of concrete bases for sign and solar panel supports.
- .2 Unless otherwise noted on the Contract Drawings or contained herein, all work shall be in accordance with AT Standard Specifications for Highway Construction – Edition 15 and AT Standard Specifications for Bridge Construction.

1.2 RELATED SECTIONS

- .1 Section 01 35 43 - Environmental Procedures.
- .2 Section 03 10 00 - Concrete Forming and Accessories.

1.3 MEASUREMENT PROCEDURES

- .1 **“Unit Price Item 2 a) – Supply and Install Concrete Bases - Standard”** shall be measured as the number of standard concrete bases poured as foundations for the dynamic message sign and payment shall include all materials, formwork, labour and other incidental items.
 - .1 An interim payment of 80% of the full value will be made if the concrete has been placed acceptably, and the 7 day test cylinder strength indicates that the concrete will reach the specified strength. Partial payment in advance of the 28 day test will not be deemed to constitute acceptance of the concrete. Full payment will not be made until the specified concrete finish meets the strength requirements of the specifications.
 - .2 Supply and installation of anchor bolts, nuts and washers and bolt grouting will not be measured but considered incidental to work.
- .2 **“Unit Price Item 2 b) – Supply and Install Concrete Bases – Non Standard”** shall be measured as the number of non-standard concrete bases poured as foundations for the solar panel arrays and payment shall include all materials, formwork, labour and other incidental items.
 - .1 An interim payment of 80% of the full value will be made if the concrete has been placed acceptably, and the 7 day test cylinder strength indicates that the concrete will reach the specified strength. Partial payment in advance of the 28 day test will not be deemed to constitute acceptance of the concrete. Full payment will not be made until the specified concrete finish meets the strength requirements of the specifications.
 - .2 Supply and installation of anchor bolts, nuts and washers and bolt grouting will not be measured but considered incidental to work.
- .3 Heating of water and aggregates and providing cold weather protection will not be measured but considered incidental to work. Include costs in Unit Price items for which concrete is required.

- .4 Cooling of concrete and providing hot weather protection will not be measured but considered incidental to work. Include costs in Unit Price items for which concrete is required.
- .5 Supply and installation of miscellaneous hardware, anchors, nuts and washers, bolt grouting, PVC ducts/tubing, waterstops or any other material encased in the concrete will not be measured but considered incidental to the work. Include costs in Unit Price items for which concrete is required.
- .6 Supply and application of concrete sealer will not be measured but considered incidental to the work. Include costs in Unit Price items for which concrete is required.

1.4 REFERENCES

- .1 American Society for Testing and Materials (ASTM). In all cases the latest edition of the specified code shall apply.
 - .1 ASTM C109/C109M, Test Method for Compressive Strength of Hydraulic Cement Mortars using 50-mm Cube Specimens.
 - .2 ASTM C260, Specification for Air-Entraining Admixtures for Concrete.
 - .3 ASTM C309, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .4 ASTM C494, Specification for Chemical Admixtures for Concrete.
 - .5 ASTM C827 Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
 - .6 ASTM D1751, Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A3000, Cementitious Materials Compendium.
 - .2 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
 - .3 CAN/CSA-A23.2, Methods of Test for Concrete.
 - .4 CAN/CSA-A23.5-M86(R1992), Supplementary Cementing Materials.
 - .5 CAN/CSA A363-M88(R1996), Cementitious Hydraulic Slag.

1.5 CERTIFICATES

- .1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Minimum 4 weeks prior to starting concrete work, submit to Departmental Representative manufacturer's test data and certification by qualified independent

inspection and testing laboratory that following materials will meet specified requirements:

- .1 Portland cement.
 - .2 Supplementary cementing materials.
 - .3 Admixtures.
 - .4 Aggregates.
 - .5 Water.
- .3 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.
 - .4 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.
 - .5 Provide certification that the alkali-aggregate reactivity and iron content of the materials has been examined and meets the requirements.

1.6 QUALITY CONTROL

- .1 Minimum 1 week prior to starting concrete work, submit proposed quality control procedures in accordance with Section 01 45 00 - Quality Control for Departmental Representative's approval for following items:
 - .1 Falsework erection.
 - .2 Hot weather concrete.
 - .3 Cold weather concrete.
 - .4 Curing.
 - .5 Finishes.
 - .6 Formwork removal.
 - .7 Contractor's Quality Control Procedures shall ensure that the Owner's and Contractor's performance requirements will be met for Class C1 exposure.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 35 43, Environmental Procedures.
- .2 Use trigger operated spray nozzles for water hoses.
- .3 Designate a cleaning area for tools to limit water use and runoff.
- .4 Carefully coordinate the specified concrete work with weather conditions.
- .5 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .6 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid

or solidify liquid with an inert, non-combustible material and remove for disposal.
Dispose of all waste in accordance with applicable local, provincial and national regulations.

- .7 Choose least harmful, appropriate cleaning method which will perform adequately.

Part 2 Products

2.1 MATERIALS

- .1 Bases may be cast in place or precast concrete.
.2 Concrete shall be Class D.
.3 Cement shall be Type HS.
.4 Reinforcing steel materials and workmanship shall be in accordance with AT specifications.

Part 3 Execution

- .1 Not used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Traffic signage details the materials, installation, and operational requirements for Dynamic Message Signs and solar panel supports to be added to existing signage along Trans-Canada Highway.

1.2 RELATED SECTIONS

- .1 Section 01 35 31 - Special Procedures for Traffic Control.
- .2 Section 01 35 43 - Environmental Procedures.

1.3 REFERENCES

- .1 ASTM A276-91a, Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
- .2 ASTM B209M-92a, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .3 ASTM B210M-92a, Specification for Aluminum-Alloy Drawn Seamless Tubes.
- .4 ASTM B211M-92a, Specification for Aluminum and Aluminum-Alloy Bar, Rods and Wire.
- .5 CAN/CSA-G40.21-M92, Structural Quality Steels.
- .6 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .7 CAN/CSA-O80 Series-M89, Wood Preservation.
- .8 CSA O121-M1978, Douglas Fir Plywood.
- .9 CSA W47.2-M1987, Certification of Companies for Fusion Welding of Aluminum.
- .10 CGSB1-GP-12c-65, Standard Paint Colours:
- .11 CAN/CGSB-1.28-M89, Alkyd, Exterior House Paint.
- .12 CAN/CGSB-1.59-M89, Alkyd, Exterior Gloss Enamel.
- .13 CAN/CGSB-1.94-M89, Xylene Thinner (Xylol).
- .14 CAN/CGSB-1.99-92, Exterior and Marine Phenolic Resin Varnish.
- .15 CAN/CGSB-1.104-M91, Semigloss Alkyd Air Drying and Baking Enamel.
- .16 CAN/CGSB-1.132-M90, Zinc Chromate Primer, Low Moisture Sensitivity.
- .17 CGSB 1-GP-189M-78, Primer, Alkyd, Wood, Exterior.
- .18 CGSB 31-GP-3M-88, Corrosion Preventive Compound, Cold Application, Soft Film.
- .19 CGSB 62-GP-9M-80, Prefabricated Markings, Positionable, Exterior, for Aircraft Ground Equipment and Facilities.
- .20 CGSB 62-GP-11M-78, Marking Material, Retroreflective, Enclosed Lens, Adhesive Backing.

1.4 MEASUREMENT PROCEDURES

- .1 Measurement for payment for Supply and Installation of Dynamic Message Signs will be based on each complete unit installed according to these specifications, and shall include all labour, equipment and material to satisfactorily complete this item of work. Payment will be made under “**Unit Bid Item 1a - Supply and Install Dynamic Message Sign**”.
- .2 Temporary removal of any existing signs or portion thereof in order to perform work relating to the installation of Dynamic Messaging hardware shall be considered incidental to the Work and will not be measured or paid for separately.
- .3 Removal and disposal of existing signs, posts and bases, and restoring the grade at the sign location, shall be measured per sign regardless of size and will be paid for under “**Unit Bid Item 1b – Removal of Existing Sign**”.
- .4 Steel Poles and Posts shall be measured and paid for each post or pole installed under the applicable bid Item based on length and type of post or pole installed. **Unit Bid Items 3a, 3b, and 3c** detail the sizes and materials required.
- .5 Installation of Concrete Bases shall be measured and paid for in accordance with Section 03 30 00 – Cast In Place Concrete.
- .6 Traffic Control required for this Work shall be incidental to “**Lump Sum Price Item 2-Traffic Accommodation**” and no separate payment will be made to the Contractor.
- .7 Mobilization and demobilization required for this Work shall be incidental to “**Lump Sum Price Item 1 - Mobilization / Demobilization**”, and no additional payment will be made.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Divert unused metal and/or plastic materials to recycling facility approved by Departmental Representative.
- .3 Damaged signs and posts from any removals to be transported to recycling facility approved by the Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Posts
 - .1 Unless otherwise noted on the Contract Drawings or herein, all materials shall conform to AT Standard Specifications for Highway Construction – Edition 15 and AT Standard Specifications for Bridge Construction.
- .2 Dynamic Message Signs and components may be ADDCO Modular Dynamic Message Sign systems or an equivalent approved by the Departmental Representative. Alternatives must meet or exceed the specifications contained herein.
- .3 Dynamic Message Components

- .1 Dynamic Message shall be designed in accordance with NEMA Standards publication TS 4, Hardware Standards for Dynamic Message Signs (DMS)
 - .2 If welding is required DMS housing shall be designed in accordance with ANSI D1.2-2003 Structural Welding Code – aluminum.
 - .3 High voltage components and circuits shall be designed, wired, and colour coded as per Canadian Electrical Code.
 - .4 DMS Control and power enclosure shall comply with type 3R enclosure criteria as described in NEMA Standards Publication 250-2003, Enclosures for Electrical Equipment (1,000 V maximum)
 - .5 All equipment shall be designed in accordance with Industry Canada Radio Standards Specification 310, defined as Category II equipment.
 - .6 All equipment shall meet applicable safety standards for maintenance access.
- .4 DMS System
- .1 DMS system shall consist of a mounting back plate, display modules, control cabinets, and all related mounting hardware.
 - .2 Shall provide front access for servicing LED display modules. Total depth of the DMS including the aluminum backplate shall be 115mm and shall contain no high voltage components or moving parts.
 - .3 All electronics with the exception of display modules shall be mounted in a pole to facilitate easy maintenance.
 - .4 The system shall be a full matrix configuration. The number and orientation of display modules vary for each sign.
 - .5 Display modules shall be composed of multiple monochrome LED clusters consisting of 4 LEDs per pixel. The LED clusters or pixels shall be encased in an environmentally sealed ABS thermoplastic enclosure.
- .5 Power Requirements
- .1 DMS shall have a 12V Direct Current maximum power draw and shall not exceed 88 amps when DMS display is operating 100% of the pixels at their maximum possible drive current.
 - .2 DMS shall have a 12V Direct Current maximum power draw and shall not exceed 22 amps when DMS display is operating 25% of the pixels at their maximum possible drive current.
 - .3 DMS shall have a 12V Direct Current maximum power draw and shall not exceed 7 amps when DMS display is operating 100% of the pixels at their lowest nighttime brightness level.
- .6 Sign Components
- .1 DMS requiring a full housing shall not be accepted. All display components will be capable of withstanding harsh vibration and environmental conditions meeting the requirements of NEMA TS 4-2005.

- .2 System shall operate in a temperature range of -34° to 74° C and a relative humidity range of 0 to 95%.
- .3 All external system hardware shall meet requirements of AT Standard Specifications for Highway Construction.
- .4 All DMS components shall be 100% solid state. No moving parts including fans, heaters, or other non-solid state components will be permitted.
- .7 Electronic Printed Circuit Boards (PCB)
 - .1 LED display module printed circuit board shall be sealed with and acrylic conformal coating.
- .8 Discrete LEDs
 - .1 DMS modules shall be constructed with discrete LEDs.
 - .2 All LEDs shall have a nominal viewing cone of 30 degrees plus or minus 2 degrees.
 - .3 LEDs shall be protected by a UV resistant polycarbonate cover.
 - .4 LED package style shall be through-hole flush mount. Through-hole LEDs with standoffs will not be accepted.
 - .5 Each LED display module shall contain a PCB to which LED pixels are soldered.
 - .6 Each LED display module shall contain pixels comprised of 96 LEDs configured in a vertical and horizontal array. The overall pixel array on the DMS shall be as indicated for each sign.
 - .7 LED pixel spacing shall be 44mm on centre.
- .9 LED Display Modules
 - .1 The body of each LED display module shall be injection molded and composed of an UV-inhibited, high-impact, ABS thermoplastic material.
 - .2 The front face of each LED display module shall be made of an UV-inhibited, polycarbonate material with an UV silk-screened mask that provides a high level of contrast and readability.
 - .3 The LED display module shall have IP64 certification for dust and water protection under the International Standard IEC 60529 Edition 2.1.
 - .4 The LED display module shall be environmentally sealed in an ABS Thermoplastic housing which does not require additional protection from environmental Conditions.
 - .5 The LED display module shall be vented in such a way to allow for thermal expansion and contraction while blocking moisture ingress via a Gore-Tex vent.
 - .6 The DMS shall provide a simple design. Each LED display module shall be based on a single printed circuit board. Designs using multiple levels of control electronics including daughter boards shall not be allowed.

- .7 Each LED display module shall connect to the back plate using vandal resistant spring loaded lock down device, which attaches to aluminum channels mounted to the back plate.
- .8 Each LED display module power and signal connections shall be a weatherproof quick-disconnect locking connector type that mates with a main bus. Connector shall be SAE J2030 waterproof connections.
- .9 Each LED display module shall be able to be removed and replaced without moving other modules.
- .10 Each LED display module shall be configured via the communication wiring harness and connector without individually addressing each module.
- .11 Removal of one or more LED modules shall not affect the structural integrity of any part of the sign.
- .12 All LED display modules shall be identical and interchangeable throughout the DMS.
- .13 The LED display module shall be capable of installation on a main mounting rail to form a full matrix, line matrix or segmented character sign.
- .14 Each LED display module shall be 19.25 inches (48.8 cm) in length, 13.75 inches (34.9 cm) in width, 2 inches (5.08cm) in depth and weigh 4.75 lbs (1.9Kg)
- .10 DMS Enclosure
 - .1 The enclosure shall be constructed from a single 3mm aluminum alloy sheet that is formed and welded to produce a single piece surround with a 7.5mm contrast border on all sides of the front display.
 - .2 LED display shall mount within the enclosure to an aluminum rail welded to the inside surface.
 - .3 Exterior finish of all visible parts of the enclosure shall be powder coated with a textured black polyester finish.
- .11 Sign Controller
 - .1 The DMS shall include sensors that monitor ambient light and internal temperature of the display modules.
 - .2 Electronic sensor shall be placed to accurately monitor ambient light levels.
 - .3 Controller shall continually monitor the light sensor and adjust LED display brightness to a level creating a legible message on the DMS.
 - .4 Controller shall shutdown the LED modules to prevent damage if the internal cabinet air exceeds 85 °C.
 - .5 Communication signals from controller to DMS shall be RS-485 for distances up to 1.2km.

- .6 Provide all the control necessary for basic operation. Basic sign operation includes the creation and activation of single and multiple page messages.
- .7 The controller shall support communication and control of a sign through its integrated serial port including the following devices:
 - A manufacturer supplied hand-held controller
 - Windows® 7 (or earlier) based PC with a serial cable
 - Modem - land line or cellular
- .8 Controller and associated communications equipment shall be installed in a pole mount enclosure or base mounted NEMA 3R enclosure.
- .9 Controller must consume less than 5W of power.

Controller shall operate at 12V direct current and withstand voltages of -25 to +25 V on power input.

.12 Wiring and Power Distribution

- .1 Back of DMS backplate shall include distribution box where all power and communication is terminated. One terminal block shall be for DC power while the other shall be for incoming DMS signal cabling or communications line.
- .2 Distribution box shall contain surge suppression for DC power and communications. Power surge suppression shall consist of thermal resettable fuses conforming to SAE specification J53 Type 1. Communications surge suppression device shall be capable of withstanding a 10kA peak surge for less than 1 nanosecond.
- .3 A main bus shall be used to connect individual display modules to the main data and power supply.
- .4 A power and communication harness bus for LED display module control shall be installed beneath the display modules on the face of the aluminum mounting channel.
- .5 The wiring harness shall not impede the removal of display modules or other sign components.
- .6 The wiring harness shall not make contact with or bend around sharp metal edges.
- .7 The wiring harness shall be capable of withstanding harsh vibration and environmental conditions as set forth by NEMA TS 4-2005.
- .8 Construction of the main bus cable shall use ultrasonic metal welding for wire splices creating a high quality metallurgical bond of the copper wires to provide reliable and consistent transmission of low-voltage signals.
- .9 Shall use weatherproof SAE J2030 waterproof connections that exceed NEMA TS-4 performance criteria for harsh environmental Conditions.
- .10 Connectors shall utilize center rib connector seals to provide reliable connector-to-connector sealing in harsh environments.

- .11 Connectors shall utilize indexing features so that incorrect mating of connectors will not allow electrical contact nor lock features to engage.
- .12 Connector termination voltage drop shall be less than 4MV/AMP to provide reliable and consistent transmission of low-voltage signals.
- .13 All wiring shall conform to the Canadian Electrical Code.
- .13 Controller cabinet shall protect all internal components from rain, ice, dust, and corrosion in accordance with NEMA Enclosure Type 3R standards, using 3.175mm thick aluminum alloy 5052-H32. The exterior of the controller shall be natural mill finish aluminum.
- .14 All work concerning concrete bases shall be in conformance with Section 03 30 00.

Part 3 Execution

3.1 BREAKAWAY STEEL POSTS AND MONO-POLES

- .1 Shop drawings shall be prepared and submitted for review at least fourteen (14) days prior to the start of fabrication.

3.2 DMS OPERATIONAL REQUIREMENTS

- .1 The sign controller's user interface shall provide for operation with a hand-held terminal (HHT). The HHT shall have an alphanumeric membrane keypad and an LCD display. The HHT shall be used to perform the following functions with the sign controller:
 - .1 When connected to the sign controller, the HHT shall:
 - .2 Set up the sign geometry parameters
 - .3 Monitor the current status of the sign controller through a monochromatic what-you-see-is-what-you-get (WYSIWYG) representation of the message visible on the display face
 - .4 Perform diagnostics testing of various system components
 - .5 Allow message activate of stored sequences
 - .6 Provide viewing of a sequence name before displaying on the DMS.
 - .2 When connected to the sign controller, the HHT shall:
 - .1 Be able to select, create, and run alphanumeric message sequences from stored library.
 - .2 Edit sign parameters such as flash rate, on and off times, calendar functions, and blinking
 - .3 Provide viewing of a sequence name before displaying on sign
 - .3 The sign controller's user interface shall allow for a desktop or laptop PC connection. This connection shall provide all the required functionality of the HHT, plus the following:
 - .1 Create, store, and run graphics via a vendor supplied application with a Windows® based interface

- .2 Provide complete remote communications when used with an appropriate cell phone and modem
- .3 Connect directly to the controller for updating message libraries
- .4 The DMS sign controller shall be capable of storing 199 factory pre-set messages standard messages and 99 operator keyboard-entered messages. All message memory consisting of 512K of flash memory and 512K DRAM memory shall be retained during power outages or failures.
- .5 The DMS sign controller shall contain a computer-readable clock that has a battery backup circuit. The battery shall keep the clock operating properly for at least 5 years without external power. The clock shall automatically adjust for daylight savings time and leap year.
- .6 The DMS controller shall have the ability to display messages on the DMS display face as required herein. The sign controller shall operate the LED display and be able to:
 - .1 Display alpha numeric characters, including letters, numbers, and punctuation
 - .2 Display variable font styles
 - .3 Justify messages on the left, center or right side the display
 - .4 Justify messages on the top, middle, and bottom of the display.
 - .5 Alternate between pages of a multiple-page message
 - .6 Display graphic bitmaps on the display.
- .7 The DMS shall be able to display messages using the following types of effects:
 - .1 Static Message - A single frame message is displayed statically on the display.
 - .2 Flashing Message - All or part of a message is displayed and blanked alternately at rates between 0.4 seconds and 9.9 seconds.
 - .3 Multiple-Page Message - A message shall contain up to six different pages of information, with each page filling the entire pixel matrix. Each page's display time is user programmable from 0.4 seconds to 25.5 seconds, and adjustable in increments of 0.1 seconds.
- .8 Messages shall be activated
 - .1 Manual - An operator using the Hand Held Terminal interface manually instructs a particular message to be activated.
- .9 A displayed message shall remain on the sign until one of the following occurs:
 - .1 The message's duration timeout expires
 - .2 The controller receives a command to change the message
 - .3 The controller receives a command to blank the sign
- .10 It shall be possible to associate a "priority" status onto any message. A command to display a priority message shall cause any lower priority message to be overridden.

- .11 The DMS sign controller shall support the storage and use of a minimum of four active (4) font sets with which messages can be formatted and displayed. Each font shall support up to 255 characters. All text font files shall include the following characters:
- .1 The letters "A" through "Z", in both upper and lower case
 - .2 Decimal digits "0" through "9"
 - .3 A blank space
 - .4 Eight (8) directional arrows
 - .5 Punctuation marks, such as: . , ! ?
 - .6 Special characters, such as: # & * + / () [] < > @
 - .7 French Characters such as é â ç
- .12 The DMS controller shall have a built in photocell that controls the light output of the display. The display module brightness shall be regulated from 1% to 100% in a minimum of 10 steps.
- .13 The DMS controller shall be capable of monitoring and displaying the currently active message on a HHT LCD display. This display shall be in a WYSIWYG format.
- .14 The manufacturer shall warranty all supplied components for one year. The warranty shall be submitted in accordance with Section 01 33 00 – Submittal Procedures.

3.3 SUPPLY AND INSTALLATION OF DYNAMIC MESSAGE SIGNS

- .1 Dynamic message signs shall be installed on existing guide signage. Existing guide signs are extruded aluminum.
- .2 Sizes of DMS arrays vary per sign and shall be in accordance with the Contract Drawings.
- .3 Installation of the new standalone dynamic message sign shall follow procedures provided in AT Standard Specifications for Highway Construction for general work and manufacturers recommendations relating specifically to the DMS components.

3.4 CLEANING

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

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 Solar panel arrays are required to provide power to each Dynamic Message Sign (DMS).
Work includes:
 - .1 Supply and installation of bases and poles.
 - .2 Supply and installation of solar panels and backup battery power sources.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 43 - Environmental Procedures
- .3 Section 10 14 53 – Traffic Signage

1.3 REFERENCES

- .1 ASTM F2200 – Standard Specification for Automated Vehicular Gate Construction
- .2 UL 325 – Door, Drapery, Gate, Louver, and Window Operators and Systems
- .3 UL 991 – Tests for Safety Related Controls Employing Solid State Devices
- .4 National Fire Protection Association – NFPA 70 National Electrical Code

1.4 MEASUREMENT PROCEDURES

- .1 Each solar panel installed shall be paid for under “**Unit Price Item 4) – Supply and Installation of Solar Panel**” and shall be considered full payment for all materials, labour, tools, equipment and other items incidental to complete the Work. Concrete bases and breakaway steel posts and poles for mounting the panels shall be paid for in accordance with Section 03 30 00 – Cast in Place Concrete and Section 10 14 53 – Traffic Signage.
- .2 All connections between the DMSs solar panel poles and solar panel arrays shall be considered incidental to the Work and will not be measured and paid for separately.

1.5 SUBMITTALS

- .1 Product Data
 - .1 Submit manufacturers printed product literature, specifications and data sheet in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Manufacturer’s Instructions
 - .1 Submit manufacturer’s installation and maintenance instructions

1.6 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section 01 45 00 – Quality Control.

Part 2 Products

- .1 RENOGY – RNG Mono 100D or equivalent solar panel as approved by Departmental representative. The solar panel must meet or exceed the following minimum requirements.
 - .1 Electrical Requirements (per panel)
 - 100 Watt maximum power
 - Optimum Operating Voltage 18.9 V
 - Optimum Operating Current 5.29 A
 - Open circuit voltage 22.5 V
 - Short circuit current 5.75 A
 - Maximum system voltage 600 V Direct Current
 - .2 Mechanical Requirements
 - Monocrystalline cell 125mm x 125mm
 - 7.5 kg maximum weight
 - Aluminum frame with tempered glass front
 - Class C fire rating
 - .3 Operates between -40 °C and 90 °C
 - .4 Nominal operating temperature of 47 °C +/- 2 degrees.
- .2 Batteries and battery level controller shall be installed at each array.
- .3 Number of panels installed at each array as shown in the Contract Drawings. Solar power calculations have been based on a 100W solar panel with dimensions of 1195 x 541 x 35 mm.

Part 3 Execution

3.1 INSTALLATION

- .1 The solar panels and associated products shall be installed by the Supplier.
- .2 Installation shall comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .3 Concrete bases, poles, and DMS may be installed and prepared by the Contractor or Supplier.

- .4 Solar panel array shall be able to be set for an optimal year round tilt of 50 degrees.

END OF SECTION