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APPENDICES

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END OF SECTION

LIST OF PROJECT DRAWINGS

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General

G000	Cover Sheet
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**Civil
Engineering**

Highway 93A

C200	Plan and Profile
C201	Plan and Profile
C202	Plan and Profile
C203	Plan and Profile
C204	Plan and Profile
C205	Plan and Profile
C206	Plan and Profile
C207	Plan and Profile
C208	Ditching Plan and Profile
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C210	Ditching Plan and Profile
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END OF SECTION

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Specific work for this contract shall be compromised of work associated with but not limited to what is indicated in the drawings and specifications.
- .2 The work includes, but is not limited to, the following:
 - .1 Clearing and underbrush clearing of approximately 370,000 m²
 - .2 Crushing and stockpiling of aggregate
 - .3 Pit Reclamation
 - .4 Full depth reclamation and reconstruction of roadway by pulverizing in place 60,900 m² of existing roadway
 - .5 Road construction, milling (530 m²), repair, patch repair, and reconstruction including granular base course and hot mix asphalt concrete (39,800 t)
 - .6 Restoration of existing and cutting of new ditches
 - .7 Cleaning out of existing culverts
 - .8 Removing old, installing new culverts and cleaning existing culverts
 - .9 ACP and asphalt curbs
 - .10 Roadway markings
 - .11 Roadway barriers and guidance
- .3 The work, unless specifically stated otherwise, shall include transportation, labour, material, tools, equipment, and all other incidentals required to complete the work. The intent is that the contractor provides a complete product.
- .4 The work shall include all required permissions, permits, and approvals; traffic accommodation; submission, revision and implementation of site specific Traffic Accommodation Plans, submission, revision and implementation of site specific Environmental Management Plans including ECO (Environmental Construction Operations) Plan, ESC (Erosion and Sedimentation Control Plan, and Spill Response procedures; supply and installation of erosion and sedimentation control (ESC); cleanup of site.
- .5 Any minor item of the work not called for in the specifications or shown on the drawings but clearly required to meet the intent of design and normally provided for the proper operation of the work shall be provided as if specifically called for in the contract documents. No additional payment will be made for this incidental work.
- .6 The contractor shall supply all material for the work unless expressly stipulated otherwise in the contract documents.

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- .7 The use of a Recycled Asphalt Mix (RAM) is not permitted for this project.

1.2 CONTRACT METHOD

- .1 Construct Work under unit price contract.

1.3 CONSTRUCTION DURATION

- .1 Certain dates with have limited or no construction activities permitted.
- .2 Fall 2017: September 11, 2017 to March 1, 2018 - Clearing and Brushing works
- .3 Spring 2018: March 1, 2018 to October 31, 2018 - All remaining work

1.4 HOURS OF OPERATION

- .1 Construction can be performed from Monday to Sunday excluding statutory holidays.
- .2 Obtain written permission from Parks Canada Representative before undertaking holiday work or work that may be disruptive to the existing park business.
- .3 Fall 2017 - 0700 – 1900
Spring 2018 - 0700 – 1900
Summer 2018 - 0900 – 1800

1.5 SITE ACCESS

- .1 Roadways shall remain open to public traffic at all times of the work.
- .2 At a minimum, one-way traffic on all roadways with flag people must be maintained during paving and any other operations. Lane closures must be detailed in the Traffic Accommodation Strategy. Works will be restricted on Highway 93A during peak commuting hours.
- .3 Allow Department Representatives, Parks Canada Personnel and Geotechnical Testing/ Inspection Agency Representatives access to the construction site at all times.

1.6 TRAFFIC ACCOMMODATION STRATEGY

- .1 Prepare and submit Traffic Accommodation Plans for approval that details the proposed methods for accommodating the Traffic during each phase of the work for each roadway.

1.7 BUSINESS LICENSE/PERMITS

- .1 All contractors and subcontractors must obtain a Business License to operate within Jasper National Park.
- .2 All business and private vehicles are required to display a vehicle work permit.

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- .3 Obtain Restricted Activity, Special Activity Permits, and Development Permits as required for each roadway. No work can be performed without the appropriate permit.

1.8 CONTRACTOR USE OF PREMISES

- .1 Accommodations are available in Jasper, Alberta. Contractor is to make their own accommodation. Camping is not allowed on site premises.
- .2 A Parks Canada Work Camp may be available in Jasper National Park. Use of the Work Camp by the Contractor is optional and subject to the Parks Canada uses regulations and fees.
- .3 Limit use of premises for Work, for storage, and for access, to allow Owner occupancy.
- .4 Co-ordinate use of premises under direction of Parks Canada Representative.
- .5 Assume full responsibility for protection and safekeeping of construction site and products under this contract.
- .6 At completion of operations restore all premises such as laydown area: equal to or better than that which existed before new work started.
- .7 Contractor to follow all environmental conditions and mitigations measures identified in Section 01 35 43 Environmental Procedures and BMPs located in Appendix B.

1.9 CONTRACTOR'S USE OF WORK CAMP

- .1 Contractor can reserve use of the individual Work Camp spaces, at a cost of \$29.40 plus GST per space. Award of spaces is on a first come first served basis, and this determination is made after award of the Contract.
- .2 Each Work Camp space can accommodate up to a Class A motor home plus vehicles as per terms of use – Appendix A.
- .3 The Work Camp is located at the intersection of Sleepy Hollow Road and Connaught Drive in Jasper, AB.
- .4 Coordinate use of Work Camp under direction of the Parks Canada Representative. Use of the Work Camp is allowed until the Contract Termination, or earlier as directed by Jasper National Park.
- .5 The Work Camp is not to be used for additional storage or work areas that may be needed for operations under this Contract. No storage or use of equipment, construction materials or machinery is allowed.
- .6 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 PCA Environmental Surveillance Officer or as directed by the Parks Canada Representative.
- .7 Use of the Work Camp must conform to the requirements contained in *J16-025 PCA Recreational Vehicle (RV) Work Camp – Sleepy Hollow Road*, Appendix A, Terms

and Conditions of Sleepy Hollow Work Camp – July 2016, as attached to these specifications.

1.10 CRITICAL ENVIRONMENTAL TIMING WINDOWS

- .1 The following are the critical environmental timing window:
 - .1 April 15 to August 31 - Migratory Bird Protection Period (Migratory Birds Convention Act)
- .2 It is preferred that clearing work including underbrush clearing be performed outside of the critical environmental timing window. However, clearing and brushing works will be permitted within the restricted period. Any clearing works undertaken within the restricted dates will require the Contractor to explicitly comply with requirements of the Act, including but not limited to nest surveys completed by qualified biologists. Additional efforts required to undertake clearing work within the restricted period will be considered incidental and the Contractor is responsible for all costs.

1.11 PROJECT SCHEDULE

- .1 The Contractor shall prepare a meaningful bar chart or network diagram showing the proposed schedules of major work, which shall be submitted to the Parks Canada Representative one (1) week prior to commencement of any work.
- .2 Ensure the project schedule includes as minimum the following milestones as applicable:
 - .1 Mobilization
 - .2 Aggregate Crushing including topsoil stripping and stockpiling
 - .3 Excavation, embankment, ditching, and other roadwork
 - .4 Surfacing
 - .5 Roadway marking, signage, and barriers and other appurtenances
 - .6 Demobilization.
- .3 Project Schedule to include dates excluded from construction as per Section 1.3.4 of this document, including long weekend dates. Schedule to be updated and resubmitted within one week if any other dates are identified.
- .4 Parks Canada Representative will review and approve or return a revised schedule within 3 working days.
- .5 Revise schedule, if required, and resubmit within 3 working days.
- .6 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.12 DOCUMENTS REQUIRED

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- .1 Maintain at job site one copy each document as follows:
 - .1 Project Drawing Sets, including all plan-profiles, typical sections, and details
 - .2 Specifications
 - .3 Addenda
 - .4 Change Orders
 - .5 Other Modifications to Contract
 - .6 Approved Work Schedule
 - .7 Contractor's Quality Control (CQC) Program
 - .8 Health and Safety Plan and Other Safety Related Documents including WHMIS if applicable
 - .9 Traffic Accommodation Plan
 - .10 Environmental Management Plan including ECO, ESC, and Spill Response
 - .11 Field Test Reports

1.13 RELICS AND ANTIQUITIES

- .1 Relics and antiquities and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found on site or in buildings to be demolished, remain property of the Owner. Protect such articles and request directives from the Parks Canada Representative.
- .2 Notify the Parks Canada Representative and stop work in the affected area immediately if evidence of archaeological finds is encountered and await the Parks Canada Representative's written instructions before proceeding with work in area.

1.14 FIELD ENGINEERING

- .1 Maintain an accurate log of any changes in the field. Record station and offset of all bid item work completed for historical record of work completed.
- .2 Layout and maintain road baseline with chainage at no more than a 30 m interval.
- .3 Subsurface Conditions:
 - .1 Promptly notify Parks Canada Representative in writing if subsurface conditions at Place of the Work differ materially from those indicated in Contract Documents, or reasonable assumption of probable conditions based thereon.
 - .2 After prompt investigation, should Parks Canada Representative determine that conditions do differ materially; instructions will be issued for changes in

the Work as provided in the contract procedures for Changes in the Work.

1.15 SETTING OUT OF WORK

- .1 Parks Canada Representative will establish control points and provide:
 - .1 Complete set of Construction Drawings.
 - .2 Locations of control points.
- .2 Contractor to
 - .1 Set additional control points as necessary.
 - .2 Set all work stakes necessary to complete the work, including marking out roadway stationing.
 - .3 Allow sufficient time to take measurements for payments. The Parks Canada Representative may need to verify the measurements for payment and the work will be coordinated with the Contractor.
 - .4 Not damage geodetic benchmarks unless authorized by Parks Canada Representative.
 - .5 At all work sites, the Contractor shall mark accurately, at regular intervals, the location and type of existing painted lines, including start and ends of passing lanes and intersections, with a stake at the side of the roadway and make a written record of markings in a book, in order that painted lines can be accurately re-established after work is completed.
- .3 All survey work required by the contractor to layout, monitor, and provide measurements for quantities for payment is considered incidental to the completion of the Works and will not be considered for separate payment.

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 Existing services.
- .2 Use of the work site.
- .3 Work conducted over or adjacent to waterways.
- .4 Access to adjacent properties.
- .5 Utilities.
- .6 Survey of existing property conditions.
- .7 Protection of persons and property.
- .8 Use of public areas.
- .9 Supervisory personnel.
- .10 Meetings.
- .11 Waste disposal.
- .12 Work stoppage.

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 Section 01 32 16.07 - Construction Progress Schedules - Bar (Gantt) Chart.
- .2 Section 01 35 31 - Special Procedures for Traffic Control.
- .3 Section 01 35 43 - Environmental Procedures.

1.4 EXISTING SERVICES

- .1 Provide for pedestrian, railway and vehicular traffic for the duration of the construction.

1.5 USE OF THE WORK SITE

- .1 The Work Sites specified in these specifications shall only be used for the purposes of the Work. The Work Sites 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 include in the tender, payment to taxes properly levied by law (Federal, Provincial and Municipal) including the cost of any collection of permits and business license.
- .3 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.
- .4 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.
- .5 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at its expense.
- .6 The Contractor will not be permitted to work on Civic Holidays or long weekends unless prior written approval is granted by the Parks Canada Representative.

1.6 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.
- .2 All components of the Work shall be conducted without equipment entering into wetlands, water bodies, streams and rivers. Refer to Section 01 35 43 - Environmental Procedures for details.
- .3 All waste materials from the Work shall be contained and collected in a manner to prevent any contact with the river valleys and waterways. All collected waste materials shall be disposed of in accordance with Section 01 35 43 - Environmental Procedures and the Environmental Protection Plan prepared for the project.

1.7 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. Existing access to property shall be maintained as far as possible and if new access must be provided, every effort shall be taken to provide the new access before the existing access is removed.

1.8 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 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 Parks Canada Representative informed of all communications with the Utility companies and authorities.

- .3 The Contractor shall notify the Parks Canada 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 Parks Canada 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.

1.9 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 Parks Canada 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 Parks Canada 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 Parks Canada 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 Parks Canada 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.

1.10 PROTECTION OF PERSONS AND PROPERTY

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

- .3 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Sites.
- .4 The Contractor shall promptly take such measures as are required to repair, replace or compensate for any loss or damage caused by the Contractor to any property or, if Parks
- .5 Canada so directs, shall promptly reimburse to Parks Canada the costs resulting from such loss or damage.

1.11 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 Sites and entering public roadways shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle.
- .3 All vehicles arriving at or leaving the Work Sites 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.

1.12 MEETINGS

- .1 The Work includes attending meetings between the Contractor and the Parks Canada Representative. The meetings will be called and chaired by the Parks Canada Representative as required. The Contractor shall be represented at such meetings to the satisfaction of the Parks Canada Representative.
- .2 The Parks Canada Representative will schedule an initial meeting to be held on site after award notification. Senior representatives of the Owner, Parks Canada 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 half hour in duration and held at initial project start-up. The Contractor shall ensure that all his current project staff is in attendance. The Parks Canada 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.

1.13 WASTE DISPOSAL

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- .1 All surplus, unsuitable and waste materials shall be removed from the job site to approved sites outside National Parks. Refer to Section 01 35 43 - Environmental Procedures.
 - .2 Deposit of any construction debris into any waterway is strictly forbidden.
 - .3 Cost for Waste 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.

1.14 WORK STOPPAGE

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

Part 2 Products

- .1 Not used.

Part 3 Execution

- .1 Not used.

END OF SECTION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 For each unit price item, Parks Canada Representative will calculate payment based on tendered unit price and Parks Canada Representative's determination of units of work item completed.
- .2 Method of measurement to be used is listed herein and may be detailed in the section of the specification covering each work item.
- .3 Each scope of work shall be inclusive of all materials and procedures required to complete the item.
- .4 Where a method of measurement for payment for a work item is not specified, payment for that item will be deemed to be included in another pay item or other pay items.

1.2 PROGRESS CLAIMS

- .1 Contractor's Responsibilities:
 - .1 Submit progress claim to Parks Canada Representative within 5 working days after each month end. Claim to cover preceding month.
 - .2 Progress claim to include all labour and materials incorporated in Work and all materials stored at Site.
 - .3 Progress claim to include all agreed extras and deductions.
 - .4 Supply documentation to support claim for materials on site in the form of itemized lists or unpriced purchase orders showing quantities.
 - .5 Supply other evidence required by Parks Canada Representative in support of progress claim including field book measurements and survey.
- .2 Parks Canada Representative's Responsibilities:
 - .1 Review Contractor's claim, prepare Progress Payment Certificate and issue to Parks Canada Representative within 10 working days following receipt of Contractor's claim.
 - .2 Parks Canada Representative's estimate of percentage of work completed will govern calculation of payment on all Progress Payment Certificates.
 - .3 Inform Contractor of amendments to claim by copy of Progress Payment Certificate.

1.3 CHANGE ORDERS

- .1 Complete and promptly return all change price requests issued by Parks Canada Representative, quoting unit and/or lump sum prices as requested. Include appropriate

supporting documentation to verify prices.

- .2 Do not proceed with work affected by price until authorized to do so by Change Order.
- .3 Make no change in the Work unless Change Order issued. Change Order is only valid when signed by Parks Canada Representatives and Contractor.

1.4 MEASUREMENT AND PAYMENT ITEMS

.1 Mobilization

- .1 Mobilization will be measured as a Lump Sum item and will include: all costs related to project set-up, mobilization and demobilization of equipment, traffic accommodation, application of all permits, submission of all requested submittals, layout and maintenance of baseline and chainage, development of the erosion and sedimentation control plan, erosion control measures as per the erosion and sedimentation control plan, dust control, cleaning of site thought-out and at the end of the project to the satisfaction of the Parks Canada Representative, restoration of all used sites including laydown yard to existing condition and better, general clean-up, labour, tools, materials, equipment and all other incidentals required to perform work under general requirements:
- .2 Payment will be made as follows, as approved by the Parks Canada:
 - .1 50% of the Lump Sum bid will be included in the first progress payment certificate after the Contractor has established their operations and facilities and performed all the required submissions.
 - .2 The remaining 50% of the Lump Sum bid will be included in the final progress payment certificate after the removal of all equipment and cleanup of the work areas to the satisfaction of the Parks Canada Representative.

.2 Traffic Accommodation

- .1 Traffic Accommodation will be measured as a Lump Sum item and will include: related to project set-up, mobilization and demobilization of equipment, develop and execute a traffic accommodation strategy and all labour, tools, materials, equipment and incidentals required to perform work.
- .2 Payment will be made as a percentage of the total work completed.

.3 Pit Reclamation

- .1 Pit Reclamation will be measured and paid by surveyed square metres of Reclamation completed.

.4 Section 02 41 13.14 - Asphalt Pavement Removal

- .1 Cold Mill Existing Asphalt Surface:
 - .1 Mill Existing Asphalt Surface will be measured and paid by the

surveyed area of asphalt removed.

- .2 The unit price to include but is not limited to saw cutting, break-out, removal of asphalt, removing loose asphalt and tack coat, hauling, loading, offsite disposal, general clean-up, labour, materials, tools, equipment and all other incidents required to perform the work.
- .2 There will be no payment made for removals beyond the limits specified or agreed to on site by the Parks Canada Representative. Contractor will restore the extra removed asphalt at his own cost
- .3 Deep Patch Repair:
 - .1 Deep patch repair requires clean cutting the existing Asphalt Surface to allow access to roadway embankment. This work is incidental under the Deep Patch repair bid item.

.5 Section 10 14 53 – Traffic Signage and Gates

- .1 Roadway signs:
 - .1 Supply and Install:
 - .1 Supply and install signs will be measured and paid for by the unit based on a physical count of signs installed.
 - .2 The unit price to include but not limited to excavation, supply and installation of the sign, pressure treated post, hardware, granular material, labour, material, tools, equipment and all other incidentals required to perform the work.
 - .2 Remove and Relocate:
 - .1 Remove and relocate signs will be measured and paid for by the unit based on a physical count of signs installed reinstalled.
 - .2 The unit price to include but not limited to excavation and salvage of existing sign and post, installation of the sign, existing post, granular material, backfill of existing post hole, labour, material, tools, equipment and all other incidentals required to perform the work.
 - .3 Remove and Replace:
 - .1 Remove and replace signs will be measured and paid for by the unit based on a physical count of signs installed.
 - .2 The unit price to include but not be limited to the disposal of the existing sign and post, excavation, supply and installation of the sign, pressure treated post, hardware, granular material,

labour, material, tools, equipment and all other incidentals required to perform the work.

.4 Remove and Salvage:

- .1 Remove and replace signs will be measured and paid for by the unit based on a physical count of signs salvaged.
- .2 The unit price to include but not limited to disposal of the existing post, hardware, backfilling the post hole, delivery of existing sign to designated location, labour, material, tools, equipment and all other incidentals required to perform the work.

.6 Section 31 05 16 - Aggregate Materials

- .1 There shall be no additional payment for items specified in this section. Aggregate materials will be paid under appropriate surfacing bid items; 32 11 16 - Granular Base and Sub-Base, 32 12 16 - Asphalt Concrete Paving. An interim crush payment may be negotiated for materials crushed and stockpiled in 2017 for 2018 works as approved by the Parks Canada Representative.

.7 Section 31 11 00 – Clearing and Grubbing

- .1 Clearing:
 - .1 Clearing and Underbrush Clearing will be measured and paid by surveyed square metres of clearing completed.
 - .2 Isolated Tree Clearing will be measured and paid by the individual tree by the unit based on a physical count of isolated trees felled.
 - .3 The price includes but is not limited to brushing, disposal offsite, loading, hauling, limbing, hauling and stockpiling of salvageable trees, traffic accommodation, labour, materials, equipment, tools and all other incidentals required to perform the work.
- .2 Grubbing:
 - .1 Grubbing work shall be minimized in ditch grading areas and shall be considered incidental to the work.

.8 Section 31 14 13 – Soil Stripping and Stockpiling

- .1 Topsoil Stripping and Stockpiling will be paid as excavation, by the cubic metre as surveyed volume measured at stockpile.
 - .1 The price to include but is not limited preparing and protecting appropriate sites for stockpile, labour, materials, equipment, tools, and all other incidentals required to perform the work.

.9 Section 31 23 33.01 – Excavation, Trenching and Backfilling

- .1 Excavation, Trenching and Backfilling will be measured and paid for by the cubic metre of each work class accepted and surveyed in place.

- .1 The price to include, but not limited to excavation of in situ materials, grading, disposal of unsuitable material offsite, delivery and placement of granular drain rock and native backfill, traffic accommodation, labour, materials, equipment, tools and all other incidentals required to perform the work. There is no distinction between excavation and trenching activities for payment.

.10 Section 32 01 16.13 – Reshaping Asphalt Pavement

- .1 Works considered reshaping Asphalt Pavement, including the Full Depth Reclamation/Pulverize of Existing Pavement Material shall be considered under Specification 32 11 17 – Reshaping Granular Road Base:

.11 Section 32 11 17 – Reshaping Granular Road Base

- .1 Reshape and Compact Existing Base Material

- .1 Reshape and compact existing base material shall be measured and paid by the square metres of road surface shaped and compacted determined by surveyed square metres of base material shaped and accepted.

- .2 The price shall include, but not limited to, grading, conducting proof rolls, disposal of contaminated or unsuitable material offsite, loading, hauling, compaction to required densities, establishment of drainage, remediation of identified soft spots, traffic accommodation, labour, materials, equipment, tools and all other incidentals required to perform the work.

- .2 Deep Patch Repair

- .1 Deep Patch repair requires removal of failed or yielding roadway embankment down to the maximum depth of a ditch bottom (where applicable) or to the extent of the failed subgrade. The failed area must be rebuilt using compacted competent granular fill material. This work is incidental under the Deep Patch repair bid item.

- .3 Pulverize Existing Pavement Material

- .1 Reshape and compact existing pavement material shall be measured and paid by the square meters of road surface shaped and compacted determined by surveyed square meters of road pulverized.
 - .2 The price shall include, but not limited to full depth reclamation by pulverizing, grading, conducting proof rolls, disposal of contaminated or unsuitable material offsite, loading, hauling, compaction to required densities, establishment of drainage, remediation of identified soft spots, traffic accommodation, labour, materials, equipment, tools and

all other incidentals required to perform the work.

.4 Granular Material:

- .1 Granular material shall be measured and paid by the tonnes of material incorporated into the site. Measurement of tonnes placed shall be measured by truck tickets delivered to the Parks Canada Representative as the truck arrives on site. Truck tickets not delivered to Parks Canada Representative once the vehicle arrives on site shall not be accepted for payment.
- .2 The price shall include, but not limited to, supply, placement, compaction, conducting proof rolls, labour, materials, equipment, tools and all other incidentals required to perform the work.
- .3 All costs associated with the incorporation of this material into the Work shall be included in other items.

.12 Section 32 12 16 - Asphalt Paving

.1 Asphalt Concrete Pavement:

- .1 Asphalt Paving for the depths and type listed in the bid form will be measured and paid for by the tonne of final asphalt surface placed and accepted by the Parks Canada Representative. Measurement of tonnes placed shall be measured by truck tickets delivered to the Parks Canada Representative as the truck arrives on site. Truck tickets not delivered to the Parks Canada Representative once the vehicle arrives on site shall not be accepted for payment.
- .2 The price is to include but is not limited to preparation of mix design and job mix formula, supply, crushing and hauling aggregates, blending of aggregates, supplying and mixing asphalt binder with the aggregate in amounts called for in the mix design, saw cutting to ensure clean vertical edges for asphalt tie-ins, removal and disposal of loose debris, tack coat, prime coat, supply and placement of asphalt, compaction, labour, materials, equipment, tools and all other incidentals required to perform the work.
- .3 All haul routes shall be inspected prior to commencement of work and again following completion of work to determine clean-up requirements. Any clean-up work not performed in a timely manner will be completed by Parks Canada with all related costs deducted from final payment.

.13 Section 32 17 23 - Pavement Markings

.1 Supply and Install Pavement Markings will be as follows:

- .1 100 mm Yellow Center Lane Dividing Line:

-
- .1 100 mm Yellow Center Lane Line will be measured and paid for by the surveyed metre of line installed.
 - .2 400 mm Stop Bar:
 - .1 400 mm Stop Bar will be measured and paid for by each number of actual stop bars installed.
 - .3 Zebra Striped Pedestrian Crossings:
 - .1 Pedestrian Crossings will be measured and paid for by each number of actual full pedestrian crossings installed.
 - .2 The price to include but is not limited to, traffic accommodation, labour, materials, equipment, tools and all other incidentals required to perform the work.
 - .3 Price for 100mm Yellow Center Lane Line to include the use of glass beads.
- .14 Section 32 92 16.16 - Hydraulic Seeding**
- .1 Hydraulic seeding to be paid in square metres of surveyed surface seeded and maintained or otherwise accepted by Parks Canada Representative at close of contract with Grass mixture including seed, mulch and fertilizer
- .15 Section 33 42 13– Pipe Culverts**
- .1 Pipe Culverts
 - .1 Supply and installation of pipe culverts to be paid in metres installed in place for each size, type and class of pipe
 - .2 Supply and installation of plastic pipe liner pipe culverts to be paid in metres installed in place for each size, type and class of pipe
 - .3 Supply and installation of perforated drain pipe to be paid in meters installed in place
 - .4 Channel excavation to be paid where required for culvert installation in tape measure cubic metres or surveyed cross sections, as accepted by Parks Canada Representative
 - .5 No separate payment will be made for couplings and fittings for steel pipe and plastic pipe culvert liners.
 - .6 Culvert cleaning shall be in metres of culvert cleared and cleaned
 - .7 No separate measurement or payment will be made for supply and install of grout of plastic pipe liners
 - .8 The installation of the Beaver Grate shall be paid as lump sum, shall follow manufacturer's specifications and applicable environmental best

practices as directed by Parks Canada Representative.

.16 Section 34 71 13.22 – Vehicle Post Delineators

.1 Delineators:

- .1** Delineators will be measured and paid by the number of units installed.
- .2** The price to include but is not limited to supply, installation, traffic accommodation, labour, materials, equipment, tools and all other incidentals required to perform the work.

.17 Section 34 71 13.22 – W-Beam Guard Rail

.1 W-Beam Guard Rail:

- .1** W-Beam will be measured by the metres of guard rail installed, measured from outer tips of steel W-beam guide rail, including guide rail used in anchorages and terminal sections.
- .2** The price to include but is not limited to supply, installation, traffic accommodation, labour, materials, equipment, tools and all other incidentals required to perform the work.
- .3** Crashworthy end treatments shall be measured by installed units.

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 Definition of Site Occupancy and Bidding Methods.

1.2 PRECEDENCE

- .1 For Federal Government projects, Division 1 Sections takes precedence over technical specifications in other divisions of this Project Manual.

1.3 RELATED SECTIONS

- .1 Section 01 11 00 – Summary of Work Clause 1.3 – Construction Duration
- .2 Section 01 11 00 – Summary of Work Clause 1.4 – Hours of Operation
- .3 Section 01 11 00 – Summary of Work Clause 1.10 – Critical Environmental Timing Windows
- .4 Section 01 14 00 – Work Restrictions

1.4 DEFINITION OF OCCUPANCY

- a) The Contractor shall be permitted to lease and occupy sites where he will be working in Jasper National Park, free of charge from the date of award of the contract up to and including completion date of construction on **October 31, 2018**.
- b) If the Contractor has not completed the work identified in the Contract, including deficiencies and completed the clean up to the satisfaction of the Departmental Representative by **October 31, 2018**, a site lease fee of \$1,500.00 per calendar day shall be payable by the Contractor to Parks Canada. The site lease fee shall be payable for each and every calendar day, commencing on **October 31, 2018** and continuing until the Contractor has completed the work and is no longer occupying the site. The maximum amount payable by the Contractor to Parks Canada shall be \$10,500.00. Contractor shall not pay a lease fee to Parks Canada on calendar days where Contractor is not permitted to work by Parks Canada, in accordance with Section 01 14 00 – Work Restrictions Sub-Section 1.5. No allowances shall be made for days of inclement weather, equipment breakdown and any other reasons.
- c) If the Contractor has completed the work identified in Contract, including deficiencies and completed the site clean up to the satisfaction of the Departmental Representative prior to **October 31, 2018**, Parks Canada will pay the Contractor an amount equal to site lease fee of \$1,500.00 per calendar day times the number of days the Contractor has completed work and is no longer occupying the sites prior to the specified completion date of **October 31, 2018**. The maximum amount payable by Parks Canada to the Contractor shall be \$10,500.00. Parks Canada shall not pay a lease fee to the Contractor on calendar days where the contractor is not permitted to work by Parks Canada, in accordance with Section 01 14 00 – Work Restrictions Sub-Section 1.5.
- d) The Contractor's occupancy of the sites identified in Contract will be deemed to have ended, when both of the following conditions are met to the satisfaction of Parks Canada:
- All the work identified under this Contract, has been completed.

- All sites clean up and any outstanding deficiencies for the work identified under this Contract have been addressed to the satisfaction of the Departmental Representative.
- Contractor has removed from the park all trailers and equipment and sites have been cleaned-up to the satisfaction of the Departmental Representative

END OF SECTION

Part 1 General

1.5 APPOINTMENT AND PAYMENT

- .1 The Parks Canada Representative will appoint and pay for services of qualified testing laboratory except as follows:
 - .1 Inspections and testing performed exclusively for ~~convenience~~ or as part of the Contractor's Quality Control program
 - .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by the Parks Canada Representative to verify acceptability of corrected work.
 - .3 Where Parks Canada Quality Assurance tests, the results shall be taken as accurate unless the Contractor has testing results to prove otherwise in that specific testing instance.

1.6 CONTRACTOR'S RESPONSIBILITIES

- .1 To provide labour, equipment and facilities to:
 - .1 Provide access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good any Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
 - .5 Develop and execute Contractor's Quality Control program with results submitted to the Parks Canada Representative within 1 business day.
 - .6 The Contractor's Quality Control program is considered incidental to the work and will not be reimbursed separately.
- .2 Notify the Parks Canada Representative 48 hours minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Parks Canada Representative.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

NOT USED

.1 Not used.

END OF SECTION

Part 1	General
1.1	SECTION INCLUDES
.1	Coordination of the Work.
.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 32 16.07 - Construction Progress Schedules – Bar (Gantt) Chart. 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 Parks Canada Representative.

1.5 PROJECT MEETINGS

- .1 Attend weekly project meetings chaired by the Parks Canada Representative, throughout progress of Work and provide information as determined by the Parks Canada Representative.
- .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 Parks Canada 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 to be chaired by the Parks Canada Representative who will also record the minutes of the meeting.

Senior representatives of the Owner, Parks Canada Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.

Agenda to include following:

- ☐ Appointment of official representative of participants in Work.
- ☐ Schedule of Work, progress scheduling in accordance with Section 01 32 16.07.
- ☐ Schedule of submittals in accordance with Section 01 33 00.
- ☐ Requirements for temporary facilities, offices, storage sheds, utilities, fences in accordance with Section 01 52 00.
- ☐ Site safety and security in accordance with Sections 01 14 00, 01 52 00 and 01 35 43.
- ☐ Quality Control in accordance with Section 01 45 00.
- ☐ Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
- ☐ Owner-furnished materials.
- ☐ Monthly progress claims, administrative procedures photographs, and holdbacks.
- ☐ Close out procedures and submittals in accordance with Sections 01 77 00 and 01 78 00.

- ☐ Insurances and transcript of policies. Other business.

Comply with Parks Canada Representative's allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.

During construction, coordinate use of site and facilities through Parks Canada Representative's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of Drawings, recommendations, and resolution of ambiguities and conflicts.

Comply with instructions of the Parks Canada Representative for use of temporary utilities and construction facilities.

Coordinate field engineering and layout work with the Parks Canada Representative.

1.7 ON-SITE DOCUMENTS

- .1 Maintain at job site, one copy each of the following:

- ☐ Contract Drawings if part of tender.
- ☐ Specifications.
- ☐ Addenda.
- ☐ Reviewed Shop Drawings and mix designs.
- ☐ Change Orders.
- ☐ Other modifications to Contract.
- ☐ Traffic Management Plan.
- ☐ Safety Plan.
- ☐ WHMIS.
- ☐ Environmental Protection Plan.
- ☐ Field test reports.
- ☐ Copy of approved Work schedule and most recent updated schedule.
- ☐ Labour conditions and wage schedules.
- ☐ Applicable current editions of municipal regulations and by-laws.

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

1.10 CONSTRUCTION PROGRESS MEETINGS

- .1 During course of Work prior to project completion, schedule progress meetings weekly.
- .2 Contractor, major Subcontractors involved in Work and Parks Canada Representative are to be in attendance. Meeting to be chaired by the Parks Canada Representative who will record the minutes of the meeting. Agenda to include following:
 - ☐ Review, approval of minutes of previous meeting.
 - ☐ Review environmental issues.
 - ☐ Review Traffic Control and Emergency response Protocol issues.
 - ☐ Review site safety and security issues.
 - ☐ Review issues as Prime Contractor and co-ordination with other contractors.
 - ☐ Review of Work progress since previous meeting.
 - ☐ Discuss field observations, problems, and conflicts. Review off-site fabrication delivery schedules.
 - ☐ Review submittal schedules: expedite as required.
 - ☐ Corrective measures and procedures to regain projected schedule.
 - ☐ Revisions to construction schedule.
 - ☐ Review Weekly Progress schedule, during succeeding work period.

- ☐ Review of quality reports since previous meeting.
- ☐ Review construction budget: Progress payments, variances from contract.
- ☐ 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 Parks Canada Representative. Payment request on last day of the month.
- .3 Submit requests for interpretation of Contract Documents, and obtain instructions through Parks Canada Representative.
- .4 Process substitutions through Parks Canada Representative.
- .5 Process change orders through Parks Canada Representative.
- .6 Deliver closeout submittals for review and preliminary inspections, for transmittal to the Parks Canada Representative.

1.12 CLOSEOUT PROCEDURES

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

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

- .1 Parks Canada Representative will schedule and administer pre construction and mid project meetings as required.
- .2 Contractor's superintendent and senior representatives of major subcontractors to attend all meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to major subcontractors.
- .4 Parks Canada Representative and make arrangements for meetings.
- .5 Parks Canada Representative will record the project start up and close out meeting minutes.
- .6 Parks Canada Representative will reproduce and electronically distribute copies of minutes within 3 days after meetings and transmit to meeting participants.
- .7 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

- .1 The Parks Canada Representative will schedule a pre-construction meeting of parties in contract within 10 days after contract award to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of the Contractor, major Subcontractors supervisors are to be in attendance.
- .3 After the time and location of the meeting has been established, the Contractor is to notify parties concerned minimum 5 days before meeting.
- .4 The Parks Canada Representative will record discussions and decisions, and circulate the minutes to all parties in concern.
- .5 Agenda to include:
 - .1 Introduction of the Project Personal.
 - .2 Notice of Award/Agreement.
 - .3 Project Work Review.
 - .4 Project Schedule.
 - .5 Temporary facilities.
 - .6 Permits

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- .7 Access.
 - .8 Environmental.
 - .9 Occupational Health and Safety.
 - .10 Emergency Services.
 - .11 Hours of Work.
 - .12 Progress Payment Certificate.
 - .13 Lien Fund.
 - .14 Force Accounts.
 - .15 Contract Change Orders.
 - .16 Construction Documents, typical cross sections and site plan.
 - .17 Construction Survey.
 - .18 Record information in accordance with Section 01 78 00 – Closeout Submittals.
 - .19 Material Testing.
 - .20 Submissions
 - .21 Insurances, transcript of policies.
 - .22 Other Business.

1.3 PROGRESS MEETINGS

- .1 Progress meetings though the progress of the work will be held on a weekly, bi-weekly, mid project, or as required.
- .2 Contractor, major Subcontractors involved in the Work and the Parks Canada Representative are to be in attendance.
- .3 Notify parties a minimum of 5 days prior to meetings.
- .4 Parks Canada Representative will record discussions and decisions, and circulate the minutes to all parties in concern.
- .5 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Construction schedule and review of work progress since previous meeting.

-
- .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Corrective measures and procedures to regain projected schedule.
 - .6 Revision to construction schedule.
 - .7 Progress schedule, during succeeding work period.
 - .8 Review submittals
 - .9 Pending changes and/or substitutions.
 - .10 Safety issues/concerns.
 - .11 Other business.

Part 2 Products

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.2 DEFINITIONS

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

1.3 REQUIREMENTS

- .1 Develop and submit a Project Master Schedule that is practical and remains within the specified Contract duration.
- .2 Include all identified contract work in the Project Schedule.
- .3 Plan to complete Work in accordance with prescribed milestones and time frame.
- .4 Limit activity durations to maximum of approximately 14 working days, to allow for progress reporting.

- .5 Award of the Contract, the time of beginning, rate of progress, Interim Certificate and Final Certificate as defined milestones and are of importance to the successful completion of this contract.

1.4 SUBMITTALS

- .1 Submit to Parks Canada Representative within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

1.5 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule:
- ☐ All clearing and brushing works to be completed by November 30, 2017.
 - ☐ Construction to be completed October 15, 2018.
 - ☐ Cleanup and demobilization to be completed by October 31, 2018

1.6 MASTER PLAN

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

1.7 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types for each road as follows:
- ☐ Mobilization
 - ☐ Soil Stripping and Stockpiling
 - ☐ Aggregate Crushing
 - ☐ Clearing
 - ☐ Roadworks
 - Pulverization, reclamation, and milling of asphalt

- Excavation, grading, ditching
 - Placement of granular base course
 - Asphalt placement
 - Asphalt curbs
- ☐ Roadway marking, signage, and barriers
- ☐ Demobilization
- .3 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .4 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

Part 2 Products

- .1 Not used.

Part 3 Execution

- .1 Not used.

END OF SECTION

Part 1 General

1.1 SUBMITTAL REQUIREMENTS

- .1 Project schedule: List of Sub-contracts and Suppliers.
- .2 Contractor's chain of command including Subcontractors.
- .3 Work plan.
- .4 Shop Drawings.
- .5 Asphalt Mix Design and product data.
- .6 Certificates.
- .7 Traffic Accommodation Strategy.
- .8 Contractor's Quality Control (CQC) Program
- .9 Environmental Management Plan (including ECO and ESC Plans)
- .10 Emergency Response Plan.
- .11 Site specific Health and Safety Plan.
- .12 Submit WHMIS MSDS - Material Safety Data Sheets
- .13 Hazardous Spill Plan.
- .14 Record Information and all Pertaining Reports.

1.2 ADMINISTRATIVE

- .1 Submit to the Parks Canada Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 At the Parks Canada Representative's request, prepare and submit schedule fixing dates for submission and return shop drawings, product data and or samples.
- .3 Do not proceed with Work affected by the submittal until the review is complete.
- .4 Present shop drawings, product data, samples and mock ups in SI Metric units.
- .5 Where items or information is not produced in SI Metric units converted values are not acceptable.
- .6 Review submittals prior to submission to the Parks Canada Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of

Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

- .7 Notify the Parks Canada Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .8 Verify field measurements and affected adjacent Work is coordinated.
- .9 Contractor's responsibility for errors and omissions in submission is not relieved by Parks Canada Representative's review of submittals.
- .10 The Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Parks Canada Representative review.
- .11 Keep one reviewed copy of each submission on site.

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Alberta.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 5 days for the Parks Canada Representative's review of each submission.
- .5 Adjustments made on shop drawings by the Parks Canada Representative are not intended to change Contract Price. If adjustments affect the value of Work, state such in writing to the Parks Canada Representative prior to proceeding with the Work.
- .6 Make changes in shop drawings as the Parks Canada Representative may require, consistent with the Contract Documents. When resubmitting, notify the Parks Canada Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
 - .1 Date
 - .2 Project title and number
 - .3 Contractor's name and address
 - .4 Identification and quantity of each shop drawing, product data and sample

.5 Other pertinent data

Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
 - Subcontractor.
 - Supplier.
 - Manufacturer.
- .1 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .2 Details of appropriate portions of Work as applicable:
 - Fabrication.
 - Layout, showing dimensions, including identified field dimensions, and clearances.
 - Performance characteristics.
 - Standards
 - Relationship to adjacent work
- .8 After the Parks Canada Representative's review, distribute copies.
- .9 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by the Parks Canada Representative.
- .10 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by the Parks Canada Representative.
- .11 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by the Parks Canada Representative.
- .12 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

-
- .13 Delete information not applicable to project.
 - .14 Supplement standard information to provide details applicable to project.
 - .15 If upon review by the Parks Canada 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.
 - .16 The review of shop drawings by the Parks Canada Representative is for sole purpose of ascertaining conformance with the general concept.
 - ☐ Date and revision dates.
 - ☐ Project title and number.

1.4 SHOP DRAWINGS AND PRODUCT DATA

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

Part 2 Products

- .1 Not used.

Part 3 Execution

- .1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Province of Alberta
 - .1 Occupational Health and Safety Act, R.S.A. 2000.

1.2 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site specific Health and Safety Plan: Within 14 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation.
- .3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .4 Submit copies of incident and accident reports.
- .5 Submit WHMIS MSDS - Material Safety Data Sheets.
- .6 The Parks Canada Representative will review the Contractor's site specific Health and Safety Plan and provide comments to the Contractor within 7 days after receipt of plan. Revise the plan as appropriate and resubmit the plan to the Parks Canada Representative within 7 days after receipt of comments from the Parks Canada Representative.
- .7 The Parks Canada Representative's review of the 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.
- .8 Submit, and post at work site, the emergency numbers for police, fire and ambulance for the locale of the work, as well as the names and after hours number for key site personnel related to health, safety or security of the site.
- .9 Notify Jasper Emergency Services (including EMS, Fire, and RCMP) prior to commencing work.

1.3 SAFETY ASSESSMENT

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

1.4 MEETINGS

- .1 Pre-Construction meeting to include a Health and Safety meeting with the Parks Canada

Representative prior to the commencement of Work.

- .2 Arrange for "Tool Box" safety meetings and submit the report to the Parks Canada Representative on a weekly basis.

1.5 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 Regulatory Requirements.
- .2 Comply with the specified standards and regulations to ensure safe operations on site.

1.6 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 The Parks Canada Representative may respond in writing, where deficiencies or concerns are noted and may request re submission with correction of deficiencies or concerns.

1.7 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.

1.8 COMPLIANCE REQUIREMENTS

- .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.

1.9 UNFORESEEN HAZARDS

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

1.10 HEALTH AND SAFETY COORDINATOR

- .1 Employ and assign to Work, competent and authorized representative to fulfill the role as Health and Safety Coordinator. The supervisor or foreman may satisfy the role of Health and Safety Coordinator. Health and Safety Coordinator must:
 - .1 Have site related working experience.

- .2 Have working knowledge of occupational safety and health regulations.
- .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .4 Be responsible for implementing, enforcing daily and monitoring site specific Contractor's Health and Safety Plan
 - .1 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.11 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 Alberta having jurisdiction, and in consultation with Parks Canada Representative.

1.12 CORRECTION OF NON COMPLIANCE

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

1.13 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

1.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Measurement Procedures for Traffic Management.
- .2 Informational and Warning Devices.
- .3 Protection and Control of Public Traffic

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 All sections in Divisions 01, 02 and 32.

1.4 MEASUREMENT PROCEDURES

- .1 Cost of Traffic Control, including temporary pavement marking and layout, described in this Section 01 35 31 and Section 01 74 11, shall be considered incidental, and no additional payment will be made the duration of the Contract.

1.5 REFERENCES

- .1 The Contractor shall provide traffic control in accordance with current edition of:
 - ☐ Alberta Transportation – Traffic Accommodation in Work Zones Manual
 - ☐ Alberta Transportation –Standard Specifications for Highway Construction, Edition 15, 2013, Section 7.1 – Traffic Accommodation and Temporary Signing.
 - ☐ Manual of Uniform Traffic Control Devices for Canada, (MUTCD) distributed by Transportation Association of Canada.

1.6 QUALITY CONTROL

- .1 All Quality Control by the Contractor.

1.7 GENERAL

- .1 The Contractor shall develop and implement a Traffic Management Plan in accordance with Alberta Transportation’s 2013 Standard Specifications for Highway Construction, Edition 15, Section 7.1 – Traffic Accommodation and Temporary Signing, except where specified otherwise in these specifications.
- .2 The Contractor shall design, supply, erect, move and maintain all traffic control

- devices, signs, temporary pavement marking, other safety measures, and provide staff to ensure safe passage of all traffic from commencement of site work to date of acceptance by the Parks Canada Representative.
- .3 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.
 - .4 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 Parks Canada Representative of the Contractor’s traffic management plan.
 - .5 Temporary pavement marking used shall be accepted by the Parks Canada Representative. These temporary pavement markings shall be in accordance with Alberta Transportation’s Traffic Accommodation in Work Zones 2008 (1st Edition) Manual. Temporary markings that conflict with the Final permanent paint lines and other associated markings will be removed at the contractor’s expense.
 - .6 Contractor shall have appropriate traffic control measures in place so that one lane of highway traffic is maintained through the work zone at all times throughout the construction.
 - .7 The Contractor shall coordinate traffic management procedures with other Contractors working in the area.

1.8 PROTECTION OF PUBLIC TRAFFIC

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 Carry out traffic regulation in accordance with the 2013 Standard Specifications for Highway Construction, Edition 15, Section 7.1 – Traffic Accommodation and Temporary Signing, except where specified otherwise.
- .3 A minimum of one lane 3.5 m wide, of traffic on roadways shall be maintained by the Contractor at all times to provide for safe movement of traveling public through work area. The Contractor shall submit a Traffic Management Plan prior to commencement of work. Short closures may be allowed by the Parks Canada Representative for some activities such as asphalt removal as long as the delay to motorists does not exceed 20 minutes.
- .4 Regardless of type of traffic control being used, maximum period of delay to public traffic shall be 20 minutes. Emergency vehicles (i.e., ambulance, RCMP, Park Warden) must be granted immediate passage at all times. The Parks Canada Representative reserves the right to reduce delay time for public traffic at times when specified delay results in excessive backup of public traffic.

- .5 The Contractor shall provide competent flag persons, properly equipped, and certified and registered as a Traffic Control Person (TCP) with the Construction Safety Network, the Construction Safety Association of British Columbia or certified using the ACSA industry standards program.
- .6 The Contractor shall also 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.
- .7 The Parks Canada Representative will monitor the traffic control measures, and he may require modifications of these measures from time to time to achieve satisfactory traffic flow, safety of traveling public and coordination with adjacent contracts.
- .8 The Contractor shall maintain a dust free construction zone by means of cleaning and watering when required.
- .9 Traffic control measures will be monitored by the Parks Canada 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.

1.9 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 Parks Canada Representative. 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 British Columbia Ministry of Transportation – Traffic Control Manual for Work on Roadways. Provide intermittent signage if work zones exceed 2.0 km in length.
- .4 Signs shall be wind resistant.
- .5 As situation at work sites changes, Contractor to update his Traffic Management Plan outlining signs and other devices required for the project and submit for the approval of the Parks Canada Representative.
- .6 Continually inspect and maintain traffic control devices in use by:
 - ☐ Checking signs daily for legibility, damage, suitability and location.
 - ☐ Cleaning, repairing or replacing signs as required ensuring clarity and reflectance.
 - ☐ Removing or covering signs which do not apply to conditions existing from day to day or time to time.

1.10 CONTROL OF PUBLIC TRAFFIC

- .1 Contractor shall provide competent flag persons, properly equipped, and certified and registered as a Traffic Control Person (TCP) with the Construction Safety Network or the Construction Safety Association of British Columbia.
- ☐ When public traffic is required to pass working vehicles or equipment, which block all or part of travelled roadway.
 - ☐ When vehicles are entering or exiting Worksite access points.
 - ☐ When it is necessary to institute one-way traffic system through construction area or other blockage and traffic signal system is not in use.
 - ☐ 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.
 - ☐ Where temporary protection is required while other traffic control devices are being erected or taken down.
 - ☐ For emergency protection when other traffic control devices are not readily available.
 - ☐ In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
 - ☐ At each end of restricted sections where pilot cars are required.

Delays to public traffic due to Contractor's operators: maximum 20 minutes.

No stoppage of traffic will be allowed for the periods specified in Section 01 14 00, Work Restrictions, 1.5 pertaining to Statutory Holiday or long weekend.

During hours of darkness, if permitted under these specification, Contractor shall determine requirements but as a minimum, flag persons shall be additionally equipped with a red signal hand-light of sufficient brightness to be clearly visible to approaching traffic and flagging stations shall be illuminated by overhead lighting. Signs indicating hazardous conditions and signs requiring increased attention shall be marked with flashers.

Part 2 Products

- .1 Not used.

Part 3 Execution

- .1 Not used.

END OF SECTION

Part 1

General

3.1

SECTION INCLUDES

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

- .25 Crushing.
- .26 Fine grading, topsoil placement and seeding.
- .27 Pavement marking and guardrail placement.
- .28 Specific concerns

3.2 RELATED SECTIONS

- .1 All Divisions 01, 02 and 32 Sections

3.3 PRECEDENCE

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

3.4 MEASUREMENT PROCEDURES

- .1 The cost of environmental and aesthetic protection 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.

3.5 SUBMITTALS

- .1 The Contractor shall describe environmental mitigation measures he will implement to ensure that all work in compliance with this Section 01 35 43 – Environmental Procedures.

3.6 NATIONAL PARK REGULATIONS

- .1 The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
- .2 For the Work in Glacier, the Contractor and any sub-Contractors shall obtain a business license from the Parks Canada Administration Office in Revelstoke, prior to commencement of the contract.

All Contractor's vehicles are required to display a vehicle work pass from Parks Canada.

- .3 These permits may be obtained free of charge from the Parks Canada Representative, or PCA Environmental Officer (ESO).

3.7 CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)

- .1 Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA) Guidelines Order of 2003 and subsequent amendments.
- .2 Failure to comply with or observe environmental protection measures as identified in these specifications may result in the work being suspended pending rectification of

the problems.

3.8 START-UP AND ENVIRONMENTAL BRIEFING

- .1 All staff employed at the construction site will be subject to an approximately half hour briefing regarding their individual and collective responsibilities to ensure avoidable adverse environmental impact do not arise from their activities and personal choices. Employees must attend this briefing before beginning their work at the site. 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 Parks Canada 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 these specifications. 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 Parks Canada 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 Parks Canada Representative.

3.9 CONSTRUCTION SITE ACCESS AND PARKING

- .1 The Contractor shall review both short and long term construction access requirements with the Parks Canada Representative, both at start-up and on an ongoing basis. In consultation with the Parks Canada 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.

3.10 PROTECTION OF WORK LIMITS

- .1 The Contractor shall ensure that workers and equipment do trespass outside the project limits to the satisfaction of the Parks Canada Representative and the ESO.

3.11 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 Parks Canada 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 Parks Canada 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.

3.12 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. Generally, hazardous or toxic products shall be stored no closer than 100 meters from water.
- .2 A Spill Response Plan will be prepared by the Contractor 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 Parks Canada Representative and the ESO and in accordance with all applicable federal and provincial legislation. The Plan 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. Generally, hazardous or toxic products shall be stored no closer than 100 metres from streams, wetlands, water bodies or waterways.
- .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 Parks Canada 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 Parks Canada Representative or ESO.
- .6 The Contractor shall provide spill kits at re-fueling, 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 Parks Canada 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 Parks Canada Representative and the ESO shall be notified immediately of any spill. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- .8 The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Parks Canada Representative and ESO.

3.13 EQUIPMENT MAINTENANCE, FUELLING AND OPERATION

- .1 The Contractor shall ensure that all soil, seeds and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) outside the National Parks before delivery to the work site.
- .2 Equipment fueling sites will be identified by the Contractor and approved by the Parks Canada Representative and the ESO. Except for chain saws, any fueling closer than 100 metres from streams, wetlands, water bodies or waterways shall require the authorization and oversight of the Parks Canada Representative.
- .3 Diesel and gasoline delivery vehicles, including bulk tankers shall be parked more than 100 metres from streams, wetlands, water bodies or waterways. Gravity fed fuel systems is not allowed. Manual or electric pump delivery systems shall be used. Fueling personnel shall maintain presence at and immediate attention to the fueling 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 1.12.4 of Pollution Control above.
- .5 Equipment used on the project shall be fueled with E10 and low Sulphur diesel fuels and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of vehicles is avoided.
- .6 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the ESO or the Parks Canada 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 National Parks.

- .7 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order.
- .8 Fuel containers and lubricant products shall be stored only in secure locations specified by the Parks Canada 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 National Parks. Alternatively, the Contractor may hire a security person employed to prevent vandalism. The Contractor is to ensure that workers are briefed on proper 'daisy-chain' use of locks to ensure no other contractor or Parks Canada is locked out.

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 Parks Canada Representative. Unless authorized by the Parks Canada 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 creeks and other 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 Parks Canada 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 Parks Canada Representative and ESO.
- .4 Restrict vehicle movements to work limits.
- .5 Workers private vehicles are to remain within the construction footprint.

1.15 FIRE PREVENTION AND CONTROL - Not required

- .1 A fire extinguisher shall be carried and available for use on each machine and at locations within the plant in the event of fire. Basic firefighting equipment recommended (e.g. a water truck; minimum 500 Imperial gallons with 500 feet of fire hose and a pump capable of producing 45 psi water pressure at the nozzle, three shovels, two pulaskis and two five gallon backpack pumps) shall be maintained at the construction site at a location known and easily accessible to all the Contractors' staff. Contractor's staff shall receive basic training in early response to wildfire events during the "environmental briefing".
- .2 A water truck may be necessary and will depend on the timing of the contract (e.g. –

not required during winter or snow covered conditions).

- .3 Construction equipment shall be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.
- .4 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented. Fires or burning of waste materials is not permitted.
- .5 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The ESO and the Parks Canada Representative shall be notified of any fire immediately. Fires or burning of waste materials is not permitted.

1.16 WILDLIFE

- .1 .1 During the Environmental Briefing all personnel shall be instructed by the ESO on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns.
- .2 Avoid or terminate activities on site that attract or disturb wildlife and vacate the area and stay away from the immediate location if bears, cougars, wolves, elk or moose display aggressive behaviour or persistent intrusion. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times.
- .3 Notify the ESO and Parks Canada Representative immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the site or crew accommodation. Other wildlife-related encounters are to be reported within 24 hours.

1.17 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 Parks Canada Representative immediately. The Contractor and workers shall wait for instructions before proceeding with their work.
- .2 All historical or archaeological objects found in National Parks are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found and request direction from the ESO or the Parks Canada Representative.

1.18 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.

All wastes originating from construction, trade, hazardous and domestic sources, shall not be mixed, but will be kept separate.

- .2 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in National Parks. These wastes shall be contained and removed in a timely and approved manner by the Contractor and workers, and disposed of at an appropriate waste landfill site located outside the park. Construction waste storage containers, provided by the Contractor, shall be emptied by the Contractor when 90% full. Waste containers will have lids, and waste loads shall be covered while being transported.
 - .3 A concerted effort shall be made by the Contractor and workers to reduce, reuse and recycle materials.
 - .4 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 National Parks. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily removal of food scraps, food wrappers, pop cans or other attractive products to bear proof containers is mandatory. It is incumbent on the Contractor to notify Parks Canada and make specific arrangements to have garbage collected by Parks Canada when using existing Parks Canada receptacles.
 - .5 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 Parks Canada Representative.
- Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition.

1.19 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES

- .1 The Contractor shall ensure trespass outside the project limits does not occur, to the satisfaction of the Parks Canada Representative and the ESO.
- .2 A Contractor's office, equipment parking, and storage area will be permitted at the Beaver pit or the Glacier Maintenance compound in Glacier National park. Other locations may be considered by the Parks Canada Representative.
- .3 No Camp will be allowed within National Parks.
- .4 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 National Parks from using public campground facilities.
- .6 Removal and storage of snow shall be arranged with the ESO and the Parks Canada 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.
- .10 Should the Contractor require/request a water source other than at the Glacier compound in Glacier National park, the Parks Canada Representative, in consultation with the ESO may give direction as to an alternative 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 ASPHALT PLANT OPERATION AND PAVING

- .1 Trucks for hauling asphalt mixture shall have tight, clean, smooth metal beds that have been sprayed with a minimum amount of thin fuel oil to prevent the mixture from adhering and causing waste asphalt. The vehicle covers shall be securely fastened. Excess truck box lubricants such as light oil, detergent or lime solutions shall not be allowed to contaminate the mix, and shall be disposed of in an environmentally acceptable manner. Truck box lubricant application shall be carried out in a containment berm.
- .2 Asphalt plant operation must comply with all environmental pollution control regulations applicable in the plant area.
- .3 The Contractor shall be responsible for the purchase and the safe delivery/storage/handling of asphalt cement and emulsions to the asphalt plant site. Excess hot mix or reject asphalt shall be temporarily stored as directed by the Parks Canada Representative, and removed from the Park, prior to completion of the contract a later date. All costs for removal and disposal shall be the responsibility of the Contractor and no separate payment shall be made.
- .4 Ground asphalt material shall be removed, recycled, or stored in the Beaver Pit, unless specified otherwise by the Parks Canada Representative.
- .5 The Contractor shall ensure that there is enough room between the stockpiles and the asphalt plant for a loader in the event of a spill at the asphalt plant. A containment berm with an associated liner made of occlusive material (e.g. plastic of a thickness approved by the Parks Canada Representative) and covered with absorbent sand or clay shall be installed under the asphalt storage tank to ensure containment of 110% of the tank's capacity.

- .6 The Contractor may wish to protect containment/catchment areas and drip trays at the asphalt plant from rainfall since, if contaminated; all of the collected water will have to be disposed of at the expense of the Contractor at an approved disposal facility.
- .7 Sites from which materials have been removed shall be restored to a neat and presentable condition upon the completion of the work.

3.2 MATERIAL LOADING, HAULING, PLACEMENT AND GRADE BUILDING

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

3.3 PAVEMENT MARKING AND GUARDRAIL PLACEMENT

- .1 Pavement marking shall be undertaken pursuant to standard methods applied in National Parks for control of paint products, both in transport and handling. The Contractor shall present a description of methods to be employed for transporting and controlling paint and hazardous products, application of paint, cleaning of equipment, containment and disposal of waste paint and cleaning products, etc. the satisfaction of the Parks Canada Representative. Where concrete barriers or guard rails are temporarily removed, for highway improvements, temporary glow posts shall be installed, at 20 m intervals on straight sections and at 10.0 m intervals on curves and shall remain in place until permanent barrier system has been installed. Payment for removal, installation and temporary glow posts to be paid under Lump Sum Item 3 b) Prime Cost Sum: Items other than Bituminous Materials.

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 Parks Canada Representative and ESO. If sediment ponds are required, they shall be designed to settle all sediment particles 0.02 mm or larger. The ponds shall also be designed to handle 1:5 year storm events, with overflow spill capacity for 1:10 year storm events and emergency spillway capacity for 1:100 year storm events.
- .2 An important desired end result is to allow no release into watercourses of sediments in levels that are deleterious to fish or that would harmfully alter, disrupt, or destroy fish habitat. Similarly there is to be no sediment release into areas of vegetation growth or sensitive areas of sediments in levels that would adversely alter growing or

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

3.5 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 Parks Canada 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 require the close oversight of the ESO or the Parks Canada 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 designated pit
- .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.

3.6 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.
- .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 require the close oversight of the ESO and the Parks Canada 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 Parks Canada 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 Parks Canada Representatives direction, the Contractor shall prepare a plan for management of each stripping pile.

3.7 BLASTING

- .1 The Parks Canada Representative will identify a magazine location for explosives should a factory site or “ready-to-use” explosives storage site be required.
- .2 The sweep of the blast area shall include looking for wildlife that may be in the area. If any are found, they shall be hazed out of the area by the ESO or a Park Warden.
- .3 The Contractor shall ensure that all work activities meet or exceed the standards outlined in DFO’s “Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters”; Canadian Technical Report of Fisheries and Aquatic Sciences 2107, 1998.
- .4 The Contractor shall, whenever explosives are used, use the Provincial and Workers’ Compensation Laws and Regulations, and all respective agencies having jurisdiction over them, such as DFO.
- .5 Steps shall be taken to minimize fly-rock and dust. Vegetation outside of the designated area shall not be damaged or destroyed.
- .6 In order to stabilize slopes of the cut, these shall be scaled of all loose material. Ditches shall be formed and cleaned upon the completion of the blasting, and the natural drainage shall be restored as specified by the contract or as directed by the Parks Canada Representative.
- .7 The Contractor shall describe the proposed type and quantities of explosives to be used on the project, to the satisfaction of the Parks Canada Representative and the ESO. Some blasting products – such as those very high in nitrogen, may have some limitations imposed for environmental protection purposes.

3.8 EXCAVATING AND PLACEMENT

- .1 Excavation will be undertaken according to the approved Grading Plan for the ROW, and approved Development Plans for the designated pits.
- .2 Materials shall be placed at storage sites or on the grade without spillage outside the working limits. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that

location.

- .3 All sediment control measures shall be implemented by the Contractor prior to the commencement of the work in the vicinity of rivers, water bodies, watercourses, and wetlands.
- .4 Special precautions may have to be taken during excavation in the vicinity of intermittent or active drainage channels.
- .5 If sediments enter a river / stream during any excavation nearby or at its banks, the Contractor shall ensure that sediment levels in the waters of the river or creeks do not exceed specified limits and meet the “desired end result” limits outlined.
- .6 Placement of rip rap and backfill at creeks shall be undertaken without contacting the watercourse or wetted margins of the stream, unless approved by the Parks Canada Representative.
- .7 Fisheries protection windows shall be observed for the fish creeks and any other watercourse in this contract and will guide the timing of the work so that stream disturbance is prevented.
- .8 If a pump-out sump to dewater excavation sites will be required, the Contractor shall detail how the dewatering shall be undertaken, to the satisfaction of the Parks Canada Representative and the ESO. Special attention is to be given to the environmental sensitivity of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond reclamation. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the Parks Canada Representative and the ESO.

3.9 CULVERT INSTALLATION

- .1 All culverts shall be installed using best management practices for working in or near water that will result in a minimum amount of sedimentation and damage to the riparian area of the watercourse. The Contractor shall prepare a plan for the installation of each culvert, a minimum one (1) week prior to doing the work for approval by the Parks Canada Representative and ESO.
- .2 The culverts shall be installed using best management practices for placement, including consideration of aquatic ecology.
- .3 It is preferable to install the culvert during periods of low discharge (e.g. during the fall). The use of sediment control measures may be necessary to ensure that excessive amounts of sediments do not enter creeks.
- .4 It may be necessary to exclude fish from the immediate construction site while the culvert is being installed. If this practice is necessary, fish shall be salvaged from within the exclusion area, and construction should be carried out expediently to minimize the time spent working in the drainage.

3.10 CONCRETE MANAGEMENT

- .1 Wet and uncured concrete is an acutely toxic substance for an aquatic environment. Extra care not to introduce these materials into the environment is required. The Contractor is to prepare a Plan which addresses concrete plant location, operation, and reclamation where required, to the satisfaction of the Parks Canada Representative and the ESO. This plan shall include the following concrete management elements:
 - ☐ Concrete mixer truck washout must be contained in an approved facility with wash products moved back to the concrete batching yard for disposal.
 - ☐ Rolling concrete mixers with surplus concrete in amounts less than one cubic metre of wet concrete may waste this concrete in the grade right-of-way as directed by the Parks Canada Representative and well away from and in areas that drain well away from watercourses. Surplus amounts in excess of one cubic metre are to be returned to the batching yard.
 - ☐ Water contaminated in the placing of cement and curing of concrete shall be contained and removed from the site to an approved disposal facility.
 - ☐ The concrete batching plant must be operated pursuant to applicable dust, air emission, and water quality control regulations.
 - ☐ Waste, solidified concrete from rolling concrete mixers in amounts less than 1 cubic meter and waste solidified concrete from construction pour, shall be buried in the grade within 48 hours of the pour, subject to approval and direction from the Parks Canada Representative.

3.11 CRUSHING

- .1 The Contractor shall be prepared for potential spills of fuels, lubricants or hydraulic fluid from the crusher using containment berms with associated occlusive liner of adequate thickness to ensure that these materials do not penetrate underlying soil materials down to the water table and into streams, running water or wetlands. In the event of a spill, the Contractor shall ensure timely and effective spill response.
- .2 The Contractor shall provide drip and spill containment for the crusher, cone, generators and other components where spills may occur (e.g. plastic lined dirt berms, collection/drip trays, and double-walled fuel tanks). Spill response in a timely and effective manner in the event of a spill is mandatory. The measure chosen by the Contractor shall ensure containment of 110% of the capacity of the fuel tank, crankcase, etc.
- .3 Excavation, hauling and placing materials associated with a crushing operation shall be conducted within the approved footprint of the total crushing operation. Crushed materials shall be placed at the designated storage site located within the Gravel Pit as identified by the Parks Canada Representative without spillage or raveling outside the limits of this location. Any material inadvertently falling outside the work limits is to be moved promptly to within the storage limits. Repair of damage outside the work limits will be at the complete expense of the Contractor.

3.13 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 Parks Canada Representative and ESO.

END OF SECTION

Part 1 General

1.1 REFERENCES AND CODES

- .1 Perform Work in accordance with the codes, regulations, and standard listed below
Amendments up to tender closing date and other codes of provincial or local
application provided that in case of conflict or discrepancy, more stringent
requirements apply:
 - .1 Canadian Transportation Agency
 - .2 Alberta Transportation.
 - .3 Alberta Infrastructure.
 - .4 Alberta Energy.
 - .5 Alberta Environment.
 - .6 Fisheries and Oceans Canada.
 - .7 Navigation Protection Act.
 - .8 Environment Canada.
 - .9 Municipal Utilities.
 - .10 Occupational Health and Safety.
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.2 COMPLIANCE WITH REGULATIONS

- .1 Ascertain requirements and regulations listed above.
- .2 Comply with all such requirements and regulations as applicable to the work.
- .3 Requirements set out in this section are for guidance and information are not
necessarily complete.

1.3 PERMITS

- .1 Obtain all required construction permits including but is not limited to:
 - .1 Parks Canada Business License.
 - .2 Restricted Activity Permit

.3 Special Activity Permit

.4 Development Permit (obtained by Parks Canada Representative)

1.4 NATIONAL PARKS ACT

- .1 Perform Work in accordance with National Parks Act when projects are located within boundaries of National Park.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 CLEANING

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

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 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 All sections in Divisions 01, 02 and 32.

1.4 MEASUREMENT PROCEDURES

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

1.5 REFERENCES

- .1 Alberta Transportation, Standard Specifications for Highway Construction Edition 15, 2013.

1.6 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:
 - ☐ 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 in accordance with the Alberta Transportation, Standard Specifications for Highway Construction Edition 15, 2013 Manual and subsequent

updates.

- .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 Parks Canada Representative in advance to enable the Parks Canada Representative to witness the tests if it so desired;
 - ☐ Notify the Parks Canada Representative when sampling will be conducted; within one Day after completion of testing, submit test results to the Parks Canada Representative; 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.

1.7 INSPECTION

- .1 Allow Parks Canada 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 Parks Canada 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 Parks Canada Representative may 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 will be engaged by the Parks Canada Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Parks Canada 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 Parks Canada Representative at no cost to the Parks Canada 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 Parks Canada 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 .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by the Parks Canada 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 Parks Canada 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 Parks Canada Representative.

1.12 REPORTS

- .1 Submit one (1) electronic copy of all inspection and test reports to Parks Canada 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 QUALITY CONTROL AND ASSURANCE

- .1 Develop a Contractor's Quality Control (CQC) program and submit to Parks Canada Representative for approval. Contractor shall be responsible for all costs associated for CQC. Results of CQC will be submitted to Parks Canada Representative within 1 business day of receipt.

1.2 TESTING LABORATORY SERVICES

- .1 Qualified Testing Agencies will be engaged by Parks Canada Representative for purpose of quality assurance testing portions of Work. Cost of such services will be borne by Parks Canada Representative. Quality assurance testing does not reduce any responsibility or testing of the CQC.

1.3 INSPECTION

- .1 Allow Parks Canada 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 Parks Canada 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 Parks Canada Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.4 ACCESS TO WORK

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

1.5 PROCEDURES

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

Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

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

1.7 REPORTS

- .1 Submit 4 copies of inspection and test reports to Parks Canada Representative.
- .2 Provide copies to subcontractor of work being inspected or tested.

1.8 MIX DESIGNS

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

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 11 – Cleaning

1.2 INSTALLATION AND REMOVAL

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

1.3 SITE STORAGE/LOADING

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

1.4 CONSTRUCTION PARKING

- .1 Parking will only be in the laydown area or along the existing roadway. Parking along an existing roadway must be in accordance with the Contractor's Traffic Accommodation Strategy and include advanced signage and pylons.
- .2 Provide and maintain adequate access to project site.

1.5 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

1.6 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 Contractor usage of campground facilities and Day-use areas is not permitted.

1.7 INSTALLATION AND REMOVAL

- .1 Contractor to provide a site specific traffic accommodation plan. Parks Canada Representative will review and approve the traffic accommodation plan.
- .2 Provide and erect project signage as per traffic accommodation plan.
- .3 Signs and notices for safety and instruction in both official languages graphic symbols to CAN/CSA 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 Parks Canada Representative.

1.8 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.
- .2 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .3 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .4 Dust control: adequate to ensure safe operation at all times.

1.9 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 21 – Construction Demolition Waste Management and Disposal

1.2 REFERENCES

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

1.3 PAYMENT

- .1 All work associated with this item is considered incidental to the work and will not be reimbursed separately.

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 FENCES AND BARRICADES

- .1 Provide secure, rigid fences and barricades around deep excavations and work area. Fences to be 1.8m high minimum.
- .2 Provide as required by governing authorities.

1.6 ACCESS TO SITE

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

1.7 PUBLIC TRAFFIC FLOW

- .1 Provide a Traffic Accommodation Strategy identifying public traffic flow.
- .2 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.8 FIRE ROUTES

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

- .2 Contractor is required to notify the Fire Department in writing of any works occurring on a fire route. Contractor is required to notify the RCMP of location of works.

1.9 PROTECTION FOR OFF SITE AND PUBLIC PROPERTY

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

1.10 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 QUALITY

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

1.2 AVAILABILITY

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

1.3 STORAGE, HANDLING AND PROTECTION

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

- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store 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 pipe on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Remove and replace damaged products at own expense and to satisfaction of Parks Canada Representative.

1.4 TRANSPORTATION

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

1.5 MANUFACTURER'S INSTRUCTIONS

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

1.6 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Parks Canada 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. Parks Canada 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 Parks Canada Representative, whose decision is final.

1.7 CO ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

1.8 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work

identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

- .2 Perform remedial work by specialists' familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

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 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 Submittal Procedures.

1.2 MATERIALS

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

1.3 PREPARATION

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.

1.4 EXECUTION

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.
- .2 Remove and replace defective and non-conforming Work.
- .3 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .4 Restore work with new products in accordance with requirements of Contract Documents.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 21 – Construction Demolition Waste Management and Disposals

1.2 PAYMENT

- .1 All work associated with this item is considered incidental to the work and will not be reimbursed separately.

1.3 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Parks Canada Representative. Do not burn waste materials on site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers for collection of waste materials and debris.
- .5 Dispose of waste materials and debris off site or as directed by the Parks Canada Representative.
- .6 Promptly clean up any spillage that occurs on construction site, site roads, access roads or public roads, or other areas where construction vehicles are travelling. Notify the Parks Canada Representative of any spillage occurred on site.
- .7 If the Contractor is negligent in maintaining cleanliness on construction site, site roads, access roads or public roads, or other areas where construction vehicles are travelling, the Parks Canada Representative will arrange for cleaning to be completed at Contractor's expense. The costs will be subtracted from final progress payment.
- .8 Use only cleaning materials recommended by the manufacturer of the surface to be cleaned, and as recommended by cleaning the material manufacturer.

1.4 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Parks Canada 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, fitments and equipment and ensure specified workmanship and operation.
 - .7 If the Contractor is negligent in maintaining cleanliness on construction site, site roads, access roads or public roads, or other areas where construction vehicles are travelling, the Parks Canada Representative will arrange for cleaning to be completed at Contractor's expense. The costs will be subtracted from final progress payment.
 - .8 Use only cleaning materials recommended by the manufacturer of the surface to be cleaned, and as recommended by cleaning the material manufacturer.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 35 43 – Environmental Procedures
- .2 Section 01 61 00 – Common Product Requirement
- .3 Section 01 74 11 – Cleaning
- .4 Section 01 74 21 – Construction Demolition Waste Management and Disposal

1.2 PAYMENT

- .1 All work associated with this item is considered incidental to the work and will not be reimbursed separately.

1.3 PROJECT CLEANLINESS

- .1 Inert Fill: inert waste - exclusively asphalt and concrete.
- .2 Recyclable: ability of product or material to be recovered at end of its life cycle and re manufactured into new product for reuse.
- .3 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .4 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .5 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .6 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .7 Separate Condition: refers to waste sorted into individual types.

1.4 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

- .1 Provide onsite facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .2 Provide containers to deposit reusable and recyclable materials.

- .3 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- .4 Locate separated material in area which minimizes material damage.
- .5 Collect, handle, store on site, and transport off site, salvaged materials in separate condition.
 - .1 Transport to approved and authorized recycling facility.
- .6 Collect, handle, store on site, and transport off site, salvaged materials in combined condition.

1.5 WASTE PROCESSING SITES

- .1 All waste, dumping and debris sites to be determined by Contractor and subject to approval by the Parks Canada Representative.

1.6 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Parks Canada Representative.
- .2 Protect, stockpile, store and catalogue salvaged items.
- .3 Separate non salvageable materials from salvaged items. Transport and deliver non salvageable items to licensed disposal facility.
- .4 Protect surface drainage, mechanical and electrical from damage and blockage.
- .5 Separate and store materials produced during dismantling of structures in designated areas.
- .6 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.

1.7 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials. Burning of rubbish or waste materials is not permitted.
- .2 Do not dispose of waste mineral spirits oil paint thinner into waterways, storm, or sanitary sewers.
- .3 Haul clean concrete materials offsite unless otherwise directed by Parks Canada Representative.
- .4 Deliver salvaged signs to Jasper National Park yard unless otherwise directed by the Parks Canada Representative.
- .5 Haul waste from brushing offsite unless otherwise directed by Parks Canada Representative.

- .6 Haul limbed trees and branches of diameter greater than 150mm to Marmot Pit unless otherwise directed by the Parks Canada Representative.
- .7 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .8 Prepare project summary to verify destination and quantities on a material by material basis as identified in pre demolition material audit.

1.8 USE OF SITE AND FACILITIES

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

1.9 SCHEDULING

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

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1

General

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 11 – Cleaning

1.2 PAYMENT

- .1 All work associated with this item is considered incidental to the work and will not be reimbursed separately.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Parks Canada Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Parks Canada Representative inspection.
 - .2 Parks Canada Representative Inspection:
 - .1 Parks Canada Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Parks Canada Representative, and Contractor.
 - .2 When Work incomplete according to Parks Canada Representative, complete outstanding items and request re-inspection.
 - .5 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance

with contractual agreement.

1.4 FINAL CLEANING

.1 Final Inspection:

- .1 When completion tasks are done, request final inspection of Work by Parks Canada Representative, and Contractor.
- .2 When Work incomplete according to Parks Canada Representative, complete outstanding items and request re-inspection.

Part 2 Products

2.2 NOT USED

- .1 Not used.

Part 3 Execution

3.2 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 77 00 - Closeout Procedures.

1.2 PAYMENT

- .1 All work associated with this item is considered incidental to the work and will not be reimbursed separately.

1.3 AS BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Parks Canada Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples on site apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Parks Canada Representative.

1.4 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings.

- .2 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
 - .4 References to related shop drawings and modifications.
 - .5 Upon completion of project, provide a copy of redline drawings showing all changes, additions, and deletions to the Parks Canada Representative showing the as-built construction details of the project.
- .4 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .5 Other Documents: maintain field test records, required by individual specifications sections.
- .6 Provide digital photos, if requested, for site records.

1.5 WARRANTIES AND BONDS

- .1 Warranty period of one (1) year from the date of substantial performance as determined by the Parks Canada Representative shall be applied for all project related items.
- .2 Unless otherwise specified, all materials incorporated into the work must be new and undamaged. Both workmanship and materials must be of the quality specified in the Contract Documents.
- .3 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .4 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- .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.

-
- .8 Except for items put into use with Parks Canada Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

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 DEFINITIONS

- .1 Asphalt Pavement Removal will include but not be limited to cold milling, asphalt pavement full depth reclamation (FDR) via pulverization, and asphalt removal as common excavation. FDR includes recycling of existing asphalt cement pavement and underlying granular base. Shaping and compacting the pulverized material is included under Section 32 11 17 - Reshaping Granular Roadbed. The pulverized reclaimed materials shall be considered as compactable granular sub base material and additional binders are not used on this project. Asphalt Pavement Removal by cold milling will be considered eligible for Recycled Asphalt Pavement use in the mix design.

Part 2 Products

2.1 EQUIPMENT

- .1 Use cold milling, planning or grinding self-powered equipment with automatic grade controls capable of operating from string line, and capable of removing part of pavement surface to depths or grades indicated. Maximum particle size of milled materials shall be 50 mm.

Part 3 Execution

3.1 PREPARATION

- .1 Prior to beginning removal operation, inspect and verify with the Parks Canada Representative areas, depths and lines of asphalt pavement to be removed.
- .2 Protect existing pavement not designated for removal and structures from damage. In event of damage, immediately replace or make repairs to approval of the Parks Canada Representative at no additional cost.

3.2 TRAFFIC SAFETY

- .1 Traffic Accommodation Strategy to include details for Asphalt Removal Work
- .2 Ramp vertical edges created by milling operations according to the following tables. Material used in the ramping must be approved by the Parks Canada Representative and must be maintained until removal prior to paving.

Transverse Edges

<u>Depth of Milling (mm)</u>	<u>Speed Limit (km/h)</u>	<u>Length of Ramp (mm)</u>	<u>Location of Ramp</u>
0 - 50	< 60	600	At end of milled area (up ramp)
0 - 50	> 60	1200	At end of milled area (up ramp)
> 50	< 60	600 600	At start of milled area (down ramp) At end of milled area (up ramp)
> 50	> 60	600 1200	At start of milled area (down ramp) At end of milled area (up ramp)

Localized Edges – Manholes, Vault Covers, Valves, Etc.

<u>Length of Milled Area (m)</u>	<u>Speed Limit (km/h)</u>	<u>Length of Ramp (mm)</u>	<u>Location of Ramp</u>
< 25	All Speeds	N/A	Paint all edges one fluorescent colour
25 or Greater	All Speeds	600	At all edges of milled area
0 - 15	< 60	600 600	At start of milled area (down ramp) At end of milled area (up ramp)
0 - 15	> 60	600 1200	At start of milled area (down ramp) At end of milled area (up ramp)

3.3 PREPARATION

- .1 Sweep the pavement surface with a mechanical sweeper to remove debris and dirt accumulations.
- .2 Remove any standing water from the pavement surface.

3.4 MILLING

- .1 Mill to depth and/or grade line as determined by the Parks Canada Representative.
- .2 Mill pavement to expose vertical surface of gutter face, manhole frames, water valves, survey monuments, power, telephone, or water vaults, or any other structures within milling area for the full required depth of milling.
- .3 Load millings into haul vehicles and transport to the Contractor's chosen location.
- .4 Minimize use of water during milling.
- .5 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.
- .6 Provide for suppression of dust generated by removal process.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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/92637.
- .2 National Fire Code of Canada 1995.
- .3 Transportation of Dangerous Goods Act (TDG Act) 1992, (T-19.01).
- .4 Transportation of Dangerous Goods Regulations (TDGR), (SOR/85-77, SOR/85-585, SOR/85-609, SOR/86-526).

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 Parks Canada 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 Parks Canada 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 Parks Canada 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 Parks Canada Representative. Submit a written spill report to Parks Canada 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 Parks Canada 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 Parks

Canada Representative.

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

Part 2 Products

2.1 MATERIALS

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

Part 3 Execution

3.1 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.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM B209M-92a, Specification for Aluminium and Aluminium -Alloy Sheet and Plate.
- .2 CAN/CSA-G40.21-M92, Structural Quality Steels.
- .3 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 CGSB 1-GP-12c-65, Standard Paint Colours.
- .5 CAN/CGSB-1.104-M91, Semi-gloss Alkyd Air Drying and Baking Enamel.
- .6 CAN/CGSB-1.132-M90, Zinc Chromate Primer, Low Moisture Sensitivity.
- .7 CGSB 31-GP-101Ma-89, Chemical Conversion Films for Aluminium and Aluminium Alloys
- .8 CGSB 31-GP-101Ma-89, Chemical Conversion Films for Aluminium and Aluminium Alloys.
- .9 Manual of Uniform Traffic Control Devices for Canada (Fourth Edition) - Transportation Association of Canada.

Part 2 Products

2.1 MATERIALS

- .1 Sign supports:
 - .1 Timber posts:
 - .1 Sawn timber posts:
 - .1 Type: pressure treated or equivalent.
 - .2 Dimensions: 4x4.
 - .3 CAN/CSA-Z809 or FSC or SFI certified.
 - .2 Posts to be treated in accordance with CAN/CSA O80 Series.
 - .2 Fasteners: bolts, nuts, washers and other hardware for roadside signs to be cast aluminum alloy, or galvanized steel.
- .2 Signboards:

Size of signs shall be as show on drawings:

 - .1 Aluminium sheet: to ASTM B209M, precut to required dimensions. Thickness

to be 1.6 mm for signboards up to 750 mm wide.

.2 Silk Screen ink:

.1 Transparent or opaque colours: to CGSB 1-GP-12c, and as indicated.

.3 Reflective sheeting and tape: to CGSB 62-GP-11M. Adhesive, class of reflectivity and colour as indicated.

.4 Transparent tape: flexible, smooth-surfaced, moisture resistant tape with pressure sensitive adhesive.

2.2 FABRICATION

.1 Sign supports:

.1 Aluminium blanks:

.1 Degrease, etch and bonderize with chemical conversion coating.

.2 Clean surfaces with xylene thinner. Dry.

.3 For non-reflective signs, spray face with one coat vinyl pretreatment coating and two finish coats of required colour.

.4 For aluminium signboards that are to be painted before installation, spray and bake face of signboards with two coats of enamel in accordance with CAN/CGSB-1.104.

.2 Reflective background sheeting and lettering:

.1 Degrease, etch and bonderize with chemical conversion coating.

.2 Cut and apply in accordance with manufacturer's instructions.

.3 Apply adhesive coated material with heat lamp vacuum applicator or by squeezeroll application method. Apply pressure sensitive material with roller or squeegee.

.4 Reflective signboard faces may be prepared using silk screen transparent ink.

.3 Clean signboards completely and apply transparent tape over top edge and extending 25 mm minimum down back and front of signboard.

Part 4 Execution

3.1 INSTALLATION

.1 Sign support:

.1 Erect posts plumb and square to details as indicated.

.2 Wooden post installation:

- .1 Excavate post holes to 200mm minimum diameter and 1500mm deep. Compact bottom of hole to provide firm foundation. Set post and backfill in 150 mm layers with excavated material. Compact each layer before placing each subsequent layer.
- .2 Leave or make depression, approximately 150mm deep, around posts until paint is dry, then backfill and compact with excavated material to ground elevation.

.2 Signboard:

- .1 Fasten signboards to supporting posts and brackets as indicated.
- .2 Fasten lane markers to signboard.

3.2 CORRECTING DEFECTS

- .1 Correct defects, identified by the Consultant, in sign message, consistency of reflectivity, colour or illumination. Correct angle of signboard angle for optimum performance during night conditions to the approval of the Consultant.

3.3 CLEANING

- .1 Deliver salvaged materials to Jasper National Park Public Works Yard.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by traffic signage installation and salvage operations.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .2 Alberta Transportation – Standard Specifications for Highway Construction (Edition 15)
 - .1 Specification 3.2 – Aggregate Production and Stockpiling
 - .2 Specification 3.6 – Granular Base Course
 - .3 Specification 3.8 – Granular Fill
 - .4 Specification 3.50 – Asphalt Concrete Pavement (EPS)

1.2 GENERAL

- .1 Parks Canada Agency will allow Contractor access to Marmot Pit for aggregate supply. Contractor is responsible for crushing and stockpiling operations to supply appropriate aggregate for all works within this project. Contractor may be required to crush and stockpile additional material of the specified gradations as directed by Parks Canada Representative. Crushing and stockpiling operations, including certified scale and truck tickets, are incidental to the work.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 Submittal Procedures.
- .2 Submit calibration of scale
- .3 Samples:
 - .1 Allow continual sampling by Parks Canada Representative during production.
 - .2 Provide Parks Canada Representative with access to source and processed material for sampling.
 - .3 Supply new or clean sample bags or containers appropriate to aggregate materials.
 - .4 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.
- .3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

Part 2 Products

2.1 MATERIALS

- .1 Granular Base Course (Road):
 - .1 Crushed stone or gravel consisting of hard, durable particles free from clay lumps, cementation, organic material, frozen material, or other deleterious materials.
 - .2 Gradation to be within limits specified when tested to ASTM C136 and ASTM C117 giving smooth curve without sharp breaks when plotted on semi-log charts.

<u>Sieve Designation</u>	<u>% Passing</u>
25 000	100
20 000	82 - 97
16 000	70 - 94
10 000	52 - 79
5 000	35 - 64
1250	18 - 43
630	12 - 34
315	8 - 26
160	5 - 18
80	2 - 10

- .3 Submit sieve analysis of granular material from qualified laboratory.
- .2 Granular Filter (Drain) Aggregate:
 - .1 Crushed stone or gravel consisting of hard, durable particles free from clay lumps, cementation, organic material, frozen material, or other deleterious materials.
 - .2 Gradation to be within limits specified when tested to ASTM C136 and ASTM C117 giving smooth curve without sharp breaks when plotted on semi-log charts.

<u>Sieve Designation</u>	<u>% Passing</u>
25 000	100
16 000	90 - 100
10 000	45 – 75
5 000	0 - 15
1 250	0 – 5

.3 Submit sieve analysis of granular material from qualified laboratory.

.3 Asphalt Concrete Pavement Mix Aggregate:

- .1 Crushed stone or gravel consisting of hard, durable particles free from clay lumps, cementation, organic material, frozen material, or other deleterious materials.
- .2 ACP crush shall meet Alberta Transportation Standard Specifications for Highway Construction, Table 3.2.2.1, Specifications for Aggregate, as well as Table 3.50.3.2 Asphalt Concrete Mix Types and Characteristics
- .3 Gradation to be within limits specified when tested to ASTM C136 and ASTM C117 giving smooth curve without sharp breaks when plotted on semi-log charts.

<u>Sieve Designation</u>	<u>% Passing</u>
12 000	100
10 000	83 – 92
5 000	55 – 70
1 250	26 – 45
630	18 – 38
315	12 – 30
160	8 – 20
80	4 – 10

.4 Submit sieve analysis of granular material from qualified laboratory.

.5 Fractures by dry mass (+ 5 mm, 2 faces) 60% minimum

.6 50% minimum manufactured fines in -5000 portion

.4 A qualified material testing laboratory designated by the Parks Canada Representative will perform the sieve analysis of the submitted samples.

.5 Flat and elongated particles of coarse aggregate: to ASTM D4791.

.1 Greatest dimension to exceed 5 times least dimension

.6 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:

- .1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
- .2 Reclaimed asphalt pavement.
- .3 Reclaimed concrete material.
- .7 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
 - .1 Crushed rock.
 - .2 Gravel and crushed gravel composed of naturally formed particles of stone.
- .8 Culvert Bedding Aggregate
 - .1 Gradation from the Granular Base Course specification may be used; while bedding material is not required to meet a specific gradation, target gradation as shown below. Mix must include enough fines and sand to bed the corrugated pipes as accepted by Parks Canada Representative.
 - .2 Crushed stone or gravel consisting of hard, durable particles free from clay lumps, cementation, organic material, frozen material, or other deleterious materials.
 - .3 Target gradation to be within limits specified when tested to ASTM C136 and ASTM C117 giving smooth curve without sharp breaks when plotted on semi-log charts.

<u>Sieve Designation</u>	<u>% Passing</u>
10 000	100
5 000	50 - 100
2 000	30 – 90
400	10 – 50
80	0 – 10

- .4 In high water table areas with poor soils, coarse granular or washed rock shall be used.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions are acceptable for topsoil stripping.
 - .1 Visually inspect substrate in presence of Parks Canada Representative.
 - .2 Inform Parks Canada Representative of unacceptable conditions immediately upon discovery.

3.2 PREPARATION

- .1 Aggregate source preparation:

-
- .1 It is expected that the Marmot Pit will be prepared for excavation prior to the works included under this project.
 - .2 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials.
 - .3 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
 - .4 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
 - .5 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water. Trim off and dress slopes of waste material piles and leave site in neat condition.
 - .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .2 Stockpiling:
- .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Parks Canada Representative. Do not stockpile on completed pavement surfaces.
 - .2 Stockpile aggregates in sufficient quantities to meet project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.
 - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
 - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Parks Canada Representative within 48 hours of rejection.
 - .7 Uniformly spot dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
 - .8 Do not cone piles or spill material over edges of piles.
 - .9 Do not use conveying stackers.
 - .10 During winter operations, prevent ice and snow from becoming mixed into

stockpile or in material being removed from stockpile.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Leave any unused aggregates in neat compact stockpiles as directed by the Parks Canada Representative.

END OF SECTION

Part 1 General

1.1 GENERAL DEFINITIONS

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

1.2 RELATED REQUIREMENTS

- .1 Section 01 25 43 – Environmental Procedures
- .2 Section 01 74 11 – Cleaning

1.3 STORAGE AND PROTECTION

- .1 Prevent damage to existing pavement and root systems of trees which are to remain. Prevent damage to landscaping, natural features, bench marks, utility lines, water courses, and any site appurtenances.
- .2 Close cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Consider felled timber (trees, sections of trees, and logs) with diameter greater than 150mm in diameter from which fuel wood can be produced as salvage timber.
 - .1 Trim limbs and tops, buck into 3.0m lengths
 - .2 Remove immediately from site. Do not impede traffic with felled timber or brush.
 - .3 Deliver to Marmot Pit and stockpile as directed by Parks Canada Representative.
- .2 Felled timber (trees, sections of trees, and logs) with diameter less than 150mm in

diameter from which the wood will not be considered as salvage timber may be chipped or mulched. Chippings and mulch must be removed from site and disposed.

Part 2 Products

2.1 MATERIALS

.1 Not applicable.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. ESC measures to be approved by Parks Canada Representative prior to installation as per the Contractor's ESC Plan.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PREPARATION

- .1 Tree and vegetation clearing will be subject restrictions under the MBCA, SARA, and Wildlife Act. Clearing should be completed outside of the migratory bird nesting window between April 15 and August 31, annually. See Specification 01 11 00 – Summary of Work, Section 1.10.2.
- .2 Inspect site and verify with Parks Canada Representative, items designated to remain.
- .3 Locate and protect utility lines: preserve in operating condition active utilities traversing site.
 - .1 Trim limbs and tops, buck into 5.0m lengths.
- .4 Notify utility Department Representative before starting clearing and grubbing
- .5 Keep roads and walks free of dirt and debris.

3.3 CLEARING

- .1 Clearing includes cutting of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within cleared areas.
- .2 Clear as directed by Parks Canada Representative, by cutting at height of not more than 300 mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 1000 mm above ground surface.

- .3 Locate and protect utility lines: preserve in operating condition active utilities traversing site.
- .4 Cut off branches and cut down trees overhanging area cleared as directed by Parks Canada Representative.
- .5 Cut off unsound branches on trees designated to remain as directed by Parks Canada Representative.

3.4 ISOLATED TREES

- .1 Cut off isolated trees as directed by Parks Canada Representative at height of not more than 300 mm above ground surface.
- .2 Grub out isolated tree stumps and transport to location specified by the Department Representative.
- .3 Prune individual trees if directed by the Department Representative.
- .4 Trim trees designated to be left standing within cleared areas of dead branches 40 mm or more in diameter; and trim branches to heights as indicated.
- .5 Cut limbs and branches to be trimmed close to bole of tree or main branches.
- .6 Paint cuts more than 3 cm in diameter with approved tree wound paint.

3.5 UNDERBRUSH CLEARING

- .1 Clear underbrush from areas as indicated at ground level.

3.6 GRUBBING

- .1 Remove and dispose of all roots, matted roots, and stumps from indicated grubbing areas.
- .2 Grub out all stumps and roots to not less than 200 mm below ground surface.
- .3 Grub out visible rock fragments and boulders, greater than 1 m³.

3.7 FINISHED SURFACE

- .1 Minimize disturbance to ground surface.
- .2 Disturbed ground surface must be repaired as directed by Parks Canada Representative at Contractors cost and left in such a condition to mitigate erosion and sedimentation.

3.8 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTARY CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to approved ECO and ESC Plans. ESC measures for stockpiled and disturbed topsoil must be included within ESC Plan.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

- .1 Ensure that procedures are conducted in accordance with applicable Provincial and Parks Canada requirements.
- .2 Remove topsoil before construction procedures commence to avoid compaction of topsoil.
- .3 Pile topsoil in stockpile berms in locations as approved by Parks Canada Representative
 - .1 Stockpile height not to exceed 2.0m.
 - .2 Stockpile berms to not restrict access for users and stakeholders
 - .3 Stockpile berms not be located within 30m of a waterbody
 - .4 Stockpile berms not to be located with any drainage course
- .4 Protect stockpiles from contamination and compaction.

3.3 PREPARATION OF GRADE

- .1 Verify that grades are correct and notify Parks Canada Representative if discrepancies occur, do not begin work until instructed by Parks Canada Representative
 - .1 Grade area only when soil is dry and workable to lessen soil compaction.

3.4 PLACING OF TOPSOIL

-
- .1 Place topsoil as per Section 32 91 19.13 - Topsoil Placement and Grading

3.5 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 35 29.06 – Health and Safety Requirements Health and Safety Act
- .2 Section 01 35 43 - Environmental Procedures
- .3 Section 01 56 00 – Temporary Barriers and Enclosures
- .4 Section 31 05 16 - Aggregate Materials.
- .5 Section 31 14 13 – Soil Stripping and Stockpiling

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM).
 - .1 ASTM C117, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422 63, Standard Test Method for Particle Size Analysis of Soils.
 - .4 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft lbf/ft³) (600 kN m/m³).
 - .5 ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft lbf/ft³) (2,700 kN m/m³).
 - .6 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.3 DEFINITIONS

- .1 Common excavation is recognized for this project. There is no rock excavation required.
 - .1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Topsoil:
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds,

and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.

- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422: Sieve sizes to CAN/CGSB 8.1.
- .8 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

1.5 EXISTING CONDITIONS

- .1 Buried services:
 - .1 Before commencing work verify location of buried services on and adjacent to site.
 - .2 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .3 Prior to beginning excavation Work, notify the applicable Parks Canada Representative; establish location and state of use of buried utilities and structures. Parks Canada Representative to clearly mark such locations to prevent disturbance during Work.
 - .4 Confirm locations of buried utilities by careful soil hydrovac methods, if required.

- .5 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

Part 2 Products

2.1 MATERIALS

- .1 Material used for embankment not to contain organic matter, frozen lumps, weeds, sod, roots, logs, stumps or any other objectionable matter. Use local native fill where possible and drain aggregate as shown on the plans.

Part 3 Execution

3.1 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Parks Canada Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

3.3 STOCKPILING

- .1 Stockpile fill material in areas designated by the Parks Canada Representative.
 - .1 Stockpile granular materials in a manner to prevent segregation.
 - .2 Cover topsoil with heavy-duty plastic.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.4 SHORING, BRACING AND UNDERPINNING

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29.06 - Health and Safety Requirements Health and Safety Act for the Province of Alberta.

- .1 Where conditions are unstable, contact the Parks Canada Representative to verify and advise of proposed methods.
- .2 Obtain permit from authority having jurisdiction for temporary diversion of water course.
- .3 During backfill operation:
 - .1 Unless otherwise indicated or directed by Parks Canada Representative, remove sheeting and shoring from excavations.
 - .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
- .4 Upon completion of substructure construction:
 - .1 Remove shoring and bracing.
 - .2 Remove excess materials from site and restore watercourses as directed by the Parks Canada Representative

3.5 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Parks Canada Representative details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
 - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run off.
- .5 Dispose of water to approved collection runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction
 - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.
- .6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

3.6 EXCAVATION

- .1 Advise the Parks Canada Representative at least 7 days in advance of excavation operations for initial cross sections to be taken. Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Do not disturb soil within branch spread of trees or shrubs that are to remain.

- .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .3 For trench excavation, unless otherwise authorized by the Parks Canada Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .4 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Parks Canada Representative.
- .5 Restrict vehicle operations directly adjacent to open trenches.
- .6 Dispose of surplus and unsuitable excavated material outside of Jasper National Park or at a designated location as directed by the Parks Canada Representative
- .7 Do not obstruct flow of surface drainage or natural watercourses. Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .8 Notify the Parks Canada Representative when bottom of excavation is reached.
- .9 Obtain the Parks Canada Representative approval of completed excavation.
- .10 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by the Parks Canada Representative.
- .11 Correct unauthorized over excavation as follows:
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
- .12 Hand trim, make firm and remove loose material and debris from excavations.
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
 - .2 Clean out rock seams and fill with concrete mortar or grout to approval of the Parks Canada Representative.

3.7 PIPE ZONE (BEDDING) MATERIAL; FRENCH DRAIN AND CULVERTS

- .1 Place bedding materials in accordance with details and as directed by the Parks Canada Representative.
- .2 Place bedding and surround material in unfrozen condition.
- .3 Shape bed true to grade and provide continuous, uniform bearing surface for barrel of pipe.

Do not use blocks when bedding pipe.

- .4 Shape traverse depressions are required to receive bell, if bell and spigot pipe is used.
- .5 Compact full of bed to 95 % Standard Proctor Density.
- .6 Bedding material to be minimum 300 mm above pipe, excepting culvert sections where the roadway granular base course intersects, as accepted by Parks Canada Representative.

3.8 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of the following:
 - .1 The Parks Canada Representative has inspected and approved installations.
 - .2 The Parks Canada Representative has inspected and approved of construction below finish grade.
 - .3 Inspection, testing, approval, and recording location of underground utilities.
 - .4 Removal of concrete formwork.
 - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations:
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast in place concrete within 24 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading.
- .6 Place fill in areas as indicated.
- .7 Consolidate and level unshrinkable fill with internal vibrators.
- .8 Install drainage system in backfill as indicated.

3.9 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by the Parks Canada Representative.
- .2 Replace topsoil as indicated.

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- .3 Reinstall areas in accordance to Section 01 35 43 Environmental Procedures.
 - .4 Reinstall pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.
 - .5 Clean and reinstall areas affected by Work as directed by the Parks Canada Representative.
 - .6 Protect newly graded areas from traffic and erosion and maintain free of trash or ~~debris~~

END OF SECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Stripping as per 31 14 13, Soil Stripping and Stockpiling
- .2 Common Excavation: measure in cubic metres calculated from cross sections taken by Contractor's horizon surveys.
 - .1 Contractor will take initial cross sections after clearing, grubbing and stripping completed and immediately prior to excavation of material to be incorporated into work.
 - .2 Contractor to supply survey data to Parks Canada Representative
- .3 Borrow: measure in cubic metres calculated from cross sections taken from survey of finished grade by Contractor Survey
 - .3 Contractor will take horizon cross sections survey prior to and immediately following the supply and compaction of borrow material.
 - .4 Contractor to supply survey data to Parks Canada Representative
- .4 No separate payment for:
 - .1 Excavating unnecessarily beyond lines established by Parks Canada Representative, with exception of unavoidable slide material. Do not measure slide material, when such slides are attributable to negligence.
 - .2 Ripping and/or drilling and blasting of material.
 - .3 Scarifying or benching existing slopes or existing road surfaces.
 - .4 Removing and disposing of roots, stumps and other materials excavated during waste operation.
 - .5 Burying existing culverts from old road.
 - .6 Removing unsuitable material from embankment attributable to negligence.
 - .7 Scaling and removing loose rock from rock face.
 - .8 Watering, drying and compacting.
 - .9 Finishing.

1.2 DEFINITION

- .1 Common Excavation: excavation of materials that are not Rock Excavation or Stripping
- .2 Stripping: excavation of organic material covering original ground

- .3 Embankment: material derived from usable excavation and placed above original ground or stripped surface up to top of subgrade.
- .4 Waste Material: material unsuitable for embankment, embankment foundation or material surplus to requirements
- .5 Borrow Material: material obtained from areas outside right-of-way and required for construction of embankments or for other portions of work.
- .6 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

Part 2 Products

2.1 MATERIALS

- .1 Embankment materials require approval by Parks Canada Representative.
- .2 Material used for embankment not to contain more than 3% organic matter by mass, frozen lumps, weeds, sod, roots, logs, stumps or other unsuitable material.
- .3 Borrow material:
 - .1 Obtain from Contractor's Supply, as approved by Parks Canada Representative.

Part 3 Execution

3.1 COMPACTION EQUIPMENT

- .1 Compaction equipment must equivalent of one 12 tonne vibratory packer capable of obtaining required densities in materials on project. Equipment that does not achieve specified densities must be replaced or supplemented.
- .2 Operate minimum equivalent of one 12 tonne vibratory packer continuously in each embankment when placing material.

3.2 STRIPPING

- .1 Strip topsoil to depths as directed by Parks Canada Representative. Do not mix topsoil with subsoil.
- .2 Remove clearing and grubbing debris from stripping.
- .3 Spread organic stripping, on completion of excavation and embankment construction, on slopes and trim or remove from site if quantity exceeds ability to grade on site.

3.3 EXCAVATING

- .1 General:
 - .1 Notify Parks Canada Representative when waste materials are encountered and remove to depth and extent directed.

- .2 Subcut 600 mm below subgrade in cut sections unless otherwise directed.
Compact top 150 mm below subcut to minimum 95% maximum dry density.
Replace with approved embankment material and compact.
- .2 Drainage:
 - .1 Maintain profiles, crowns and cross slopes to provide good surface drainage.
 - .2 Provide ditches as work progresses to provide drainage.
 - .3 Construct interceptor ditches as indicated or as directed before excavating or placing embankment in adjacent area.

3.4 EMBANKMENTS

- .1 Scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces. Method used to be subject to prior approval of Parks Canada Representative.
- .2 Break up or scarify existing road surface prior to placing embankment material.
- .3 Do not place material which is frozen nor place material on frozen surfaces except in areas authorized.
- .4 Maintain crowned surface during construction to ensure ready run-off of surface water.
- .5 Deductions from excavation will be made for overbuild of embankments.

3.5 SUBGRADE COMPACTION

- .1 Break material down to sizes suitable for compaction and mix for uniform moisture to full depth of layer.
- .2 Compact each layer to minimum 95% maximum dry density, except top 150 mm of subgrade. Compact top 150 mm to 98% maximum dry density.
- .3 Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.

3.6 FINISHING

- .1 Shape entire roadbed to within 35 mm of design elevations.
- .2 Finish slopes, ditch bottoms and borrow pits true to lines, grades and drawings where applicable.
- .3 Remove rocks over 150 mm in dimension from slopes and ditch bottoms.
- .4 Hand finish slopes that cannot be finished satisfactorily by machine.
- .5 Round top of backslope 1.5 m both sides of top of slope.

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- .6 Trim between constructed slopes and edge of clearing to provide drainage and free of humps, sags and ruts.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 32 11 23 - Aggregates: General.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
- .1 ASTM C117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .2 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .4 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
- .5 ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).
- .6 ASTM D1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
- .7 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

1.3 DELIVERY, STORAGE, AND HANDLING

- .1 Crush and stockpile aggregates in accordance with Section 32 11 23 - Aggregates General. Stockpile minimum 50% of total aggregate required prior to beginning operation.

Part 2 Products

2.1 MATERIALS

- .1 Granular base: material in accordance with Section 32 11 23 - Aggregates: General.

Part 3 Execution

3.1 SEQUENCE OF OPERATION

- .1 Place granular base only after sub-base or subgrade surface is inspected and approved by Parks Canada Representative.
- .2 Placing
 - .1 Construct granular base to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface properly shaped and compacted, and free from snow and ice.
 - .4 Begin spreading base material on crown line or on high side of one-way slope.
 - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Parks Canada Representative may authorize thicker lifts if specified compaction can be achieved.
 - .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .8 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3 Compaction Equipment
 - .1 Compaction equipment to be capable of obtaining required material densities.
 - .2 Equipped with device that records hours of actual work, not motor running hours.
- .4 Compacting
 - .1 Compact to density not less than 100% of Standard Proctor Density ASTM D698 at optimum moisture content.
 - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .3 Apply water as necessary during compacting to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected. In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.
 - .4 Correct surface irregularities by loosening and adding or removing material

until surface is within specified tolerance.

- .5 The top of the finished base shall exhibit a smooth, continuously dense surface.

.5 Proof Rolling

- .1 For proof rolling use standard roller of 45400 kg gross mass with four pneumatic tires each carrying 11350 kg and inflated to 620 kPa. Four tires arranged abreast with centre to centre spacing of 730 mm.
- .2 Obtain approvals from Engineer to use nonstandard proof rolling equipment.
- .3 Proof roll at level in granular base as indicated. If use of nonstandard proof rolling equipment is approved, Engineer to determine level of proof rolling.
- .4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.
- .5 Where proof rolling reveals areas of defective subgrade:
 - .1 Remove base, sub-base and subgrade material to depth and extent as directed by Parks Canada Representative.
 - .2 Replace subbase material and compact.
- .6 Where proof rolling reveals defective base or sub-base, remove defective materials to depth and extent as directed by Engineer and replace with new materials in accordance with this section at no extra cost.

3.2 SITE TOLERANCES

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.
- .2 Correct surface irregularities and adding or removing material until surface is within specified tolerance.

3.3 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 05 16 – Aggregate Materials

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C117, Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131, Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136, Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m³).
 - .5 ASTM D4318, Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-8.1, Sieves Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2, Sieves Testing, Woven Wire, Metric.

Part 2 Products

2.1 MATERIALS

- .1 Granular base material: to Section 31 05 16 - Aggregate Materials.

Part 3 Execution

3.1 SEQUENCE OF OPERATION

- .1 Grade Road:
 - .1 Grade road to remove contaminated surface material. Dispose of contaminated material off site.
 - .2 Full Depth Reclamation under this project shall include recycling of existing asphalt cement pavement and underlying granular base into a competent and accepted granular roadbed. Where FDR is indicated on the contract drawings, the existing asphalt concrete roadbed shall be pulverized, compacted, and shaped.

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- .2 Proof Roll Existing Granular Base:
 - .1 Conduct a proof roll of the existing granular base course.
 - .2 Replace identified soft spots as directed by the Parks Canada Representative
 - .3 Shape Road:
 - .1 Shape road surface to establish a 2% crown.
 - .2 Where deficiency of material exists, add and blend in new granular base material as directed by the Parks Canada Representative. Ensure no frozen material is used.
 - .4 Compacting:
 - .1 Compact to density minimum 98% corrected maximum dry density.
 - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .3 Apply water as necessary during compaction to obtain specified density.
 - .5 Repair of Soft Areas:
 - .1 Correct soft areas by removing defective material to depth and extent directed by the Parks Canada Representative. Replace with material acceptable to the Parks Canada Representative and compact to specified density.
 - .2 Maintain reshaped surface in condition conforming to this section until succeeding material is applied or until acceptance by Parks Canada Representative.

3.2 SITE TOLERANCES

- .1 Reshaped compacted surface with positive drainage:

END OF SECTION

Part 1	General
1.1	SECTION INCLUDES
.1	Materials and application of asphalt tack coat to an existing asphalt or concrete surface prior to asphalt paving.
1.2	RELATED SECTIONS
.1	Section 01 33 00 - Submittal Procedures.
.2	Section 01 35 43 - Environmental Procedures.
.3	Section 32 12 16 – Asphalt Concrete Pavement
1.3	MEASUREMENT PROCEDURES
.1	Supply, Delivery and Application of tack coat will be will not be measured separately and will be considered to be incidental to “Unit Price Item 2 - Asphalt Concrete Pavement”.
1.4	REFERENCES
.1	American Society for Testing and Materials International, (ASTM)
.1	ASTM D140-01, Standard Practice for Sampling Bituminous Materials.
.2	Canadian General Standards Board (CGSB)
.1	CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.
1.5	SUBMITTALS
.1	Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.2	Submit two - 1 L samples of asphalt tack coat material proposed for use in new, clean, airtight, sealed, wide mouth bottles made with plastic to Parks Canada Representative, at least 2 weeks prior to beginning Work.
.3	Sample asphalt tack coat material to: ASTM D140.
.4	Provide access on tank truck for Parks Canada Representative to sample asphalt material to be incorporated into Work, in accordance with ASTM D140.
1.6	QUALITY ASSURANCE
.1	Upon request by Parks Canada Representative, submit manufacturer's test data and certification that asphalt tack coat material meets requirements of this Section.
1.7	DELIVERY, STORAGE AND HANDLING

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

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 35 43 - Environmental Procedures and with the Waste Reduction Work Plan.
- .2 Divert unused asphalt materials to facility capable of recycling materials.

Part 2 Products

2.1 MATERIALS

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

2.2 EQUIPMENT

- .1 Pressure distributor to be:
 - ☐ Designed, equipped, maintained and operated so that asphalt material can be:
Maintained at even temperature.
 - ☐ Applied uniformly on variable widths of surface up to 5 m.
 - ☐ Applied at readily determined and controlled rates from 0.2 to 5.4 L/m² with uniform pressure, and with an allowable variation from any specified rate not exceeding 0.1 L/m².
 - ☐ Distributed in uniform spray without atomization at temperature required.
- .2 Equipped with meter, registering metres of travel per minute, visibly located to enable truck driver to maintain constant speed required for application at specified rate.
- .3 Equipped with pump having flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator. Pump power unit to be independent of truck power unit.
- .4 Equipped with an easily read, accurate and sensitive device which registers temperature of liquid in reservoir.
- .5 Equipped with accurate volume measuring device or calibrated tank.
- .6 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation.
- .7 Equipped with nozzle spray bar, with operational height adjustment.
- .8 Cleaned if previously used with incompatible asphalt material.

Part 3 Execution

3.1 APPLICATION

- .1 Obtain Parks Canada Representative's approval of surface before applying asphalt tack coat.
- .2 Apply asphalt tack coat only on clean and dry surface.
- .3 Dilute asphalt emulsion with water at 1:1 ratio for application.
 - .1 Mix thoroughly by pumping or other method accepted by Parks Canada Representative.
- .4 Apply asphalt tack coat evenly to pavement surface at rate as directed by Parks Canada Representative, of 0.5 L/m² plus or minus 0.2 L/m².
- .5 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.
- .6 Do not apply asphalt tack coat when air temperature is less than 10 degrees C or when rain is forecast within 2 hours of application.
- .7 Apply asphalt tack coat only on unfrozen surface.
- .8 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Parks Canada Representative.
- .9 Where traffic is to be maintained, treat no more than one half of width of surface in one application.
- .10 Keep traffic off tacked areas until asphalt tack coat has set.
- .11 Re-tack contaminated or disturbed areas as directed by Parks Canada Representative.
- .12 Permit asphalt tack coat to set before placing asphalt pavement.

END OF SECTION

Part 1

General

1.1 RELATED SECTIONS

- .1 Section 01 11 00 – Summary of Work.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 31 – Special Procedures for Traffic Control.
- .4 Section 01 35 43 - Environmental Procedures.
- .5 Section 02 41 13.14 - Asphalt Pavement Removal.
- .6 Section 32 12 13.16 - Asphalt Tack Coat

1.2 MEASUREMENT PROCEDURES

- .1 Asphalt prime coat is incidental to placement of asphalt concrete.

1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 A ASTM D 140-[01], Standard Practice for Sampling Bituminous Materials.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-16.1-[M89], Cutback Asphalts for Road Purposes.
 - CAN/CGSB-16.2-[M89], Emulsified Asphalts, Anionic Type, for Road Purposes

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Sample asphalt prime coat materials in accordance with ASTM D 140.
- .3 Provide access on tank truck for Parks Canada Representative to sample asphalt material to be incorporated into Work, in accordance with ASTM D 140.

1.5 QUALITY ASSURANCE

- .1 Upon request from Parks Canada Representative, submit manufacturer's test data and certification that asphalt prime material meets requirements of this Section in accordance with Section 01 33 00 - Submittal Procedures.

1.6 DELIVERY, STORAGE AND HANDLING

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

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- .2 Deliver, store and handle materials to ASTM D 140.

Part 2 Products

2.1 MATERIAL

- .1 Asphalt material: to CAN/CGSB-16.2 grade: SS-1.
- .2 Sand blotter: clean granular material passing 4.75 mm sieve and free from organic matter or other deleterious materials.
- .3 Water: clean, potable, free from foreign matter.

2.2 EQUIPMENT

- .1 Pressure distributor to be:
- .1 Designed, equipped, maintained and operated so that asphalt material can be:
 - .1 Maintained at even temperature.
 - .2 Applied uniformly on variable widths of surface up to [5] m.
 - .3 Applied at controlled rates from 0.2 to 5.4 L/m² with uniform pressure, and allowable variation from any specified rate not exceeding 0.1 L/m².
 - .4 Distributed in uniform spray without atomization at temperature required.
 - .2 Equipped with meter registering metres of travel per minute, visibly located to enable truck driver to maintain constant speed required for application at specified rate.
 - .3 Equipped with pump having flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator. Pump power unit to be independent of truck power unit.
 - .4 Equipped with easily read, accurate and sensitive device which registers temperature of liquid in reservoir.
 - .5 Equipped with accurate volume measuring device or calibrated tank.
 - .6 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation.
 - .7 Equipped with nozzle spray bar, with operational height adjustment.
 - .8 Cleaned if previously used with incompatible asphalt material.

Part 3 Execution

3.1 MATERIAL

- .1 Obtain Parks Canada Representative's approval of granular base surface before applying asphalt prime.
- .2 Apply asphalt prime only on unfrozen surface.
- .3 Do not apply prime when air temperature is less than 5 degrees C or when rain or snow is forecast within 2 hours.
- .4 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt prime material.
- .5 Where traffic is to be maintained, treat no more than one-half width of surface in one application.
- .6 Prevent overlap at junction of applications.
- .7 Do not prime surfaces that will be visible when paving is complete.
- .8 Apply additional material to areas not sufficiently covered as directed by Parks Canada Representative.
- .9 Keep traffic off primed areas until asphalt prime has cured, or until 6 hours following application.
- .10 Permit prime to cure before placing asphalt paving.

3.2 USE OF SAND BLOTTER

- .1 If asphalt prime fails to penetrate within 24 hours, spread sand blotter material in amounts required to absorb excess material.
- .2 Allow sufficient time for excess prime to be absorbed.
- .3 Apply second application of sand blotter as required.
- .4 Sweep and remove excess blotter material.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 11 00 – Summary of Work.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 31 – Special Procedures for Traffic Control.
- .4 Section 01 35 43 - Environmental Procedures.
- .5 Section 02 41 13.14 - Asphalt Pavement Removal.
- .6 Section 32 12 13.16 - Asphalt Tack Coat

1.2 REFERENCES

- .1 Alberta Transportation Standard Specifications for Highway Construction Edition 15, 2013, Section 3.50 – Asphalt Concrete Pavement (EPS)

1.3 DESCRIPTION

- .1 Asphalt concrete pavement (ACP) shall consist of crushed aggregates, or a combination of crushed aggregates and reclaimed asphalt pavement (RAP), blend sand material as required and asphalt cement, combined in a hot mix plant, placed and compacted on a prepared surface in conformity to the lines, grades, dimensions and cross-sections as shown on the Drawings or as directed by the Consultant.

1.4 DEFINITIONS

- .1 For purposes of this specification, the following definitions will apply:
 - .1 Acceptance Limits
 - .1 Density and Actual Asphalt Content - Acceptance Limits for density and Actual Asphalt Content are the limiting values of the Lot Mean within which the Lot will be accepted at full, increased, or reduced payment for density, as shown in Table 3.50 A, or full or reduced payment for Actual Asphalt Content as shown in Table 3.50 B.
 - .2 Gradation - Acceptance Limit for gradation is the limiting value of the Lot Mean within which the Lot will be accepted as shown in Table 3.50 E.
 - .2 Asphalt Content
 - .1 Design Asphalt Content - The Asphalt Content established by the approved mix design.
 - .2 Approved Asphalt Content - The Design Asphalt Content or subsequent adjustments to it. Such adjustments must be approved in writing by the

Consultant.

- .3 Actual Asphalt Content - The amount of asphalt binder in the mix as determined by ATT-12 or ATT-74, and includes an amount to correct for the asphalt binder lost due to absorption by the aggregate or aggregate loss. This correction may be determined for each change in aggregate or asphalt binder.

.3 End Product Specification (EPS)

- .1 A specification, whereby Parks Canada does not define methods of construction. Under EPS, Parks Canada will monitor the Contractor's control of the process that produces the items of construction and will accept or reject the end product according to a specified acceptance plan. The Contractor is entirely responsible for quality control. End product acceptance is the responsibility of Parks Canada and includes a statistically oriented program of acceptance testing. Job Mix Formula.
- .2 The Job Mix Formula establishes the aggregate proportioning, target aggregate gradation and approved asphalt content to be used for production of asphalt mix and requires the approval of the Consultant on the basis of a mix design.

.4 Lot

- .1 A Lot is a portion of the Work being considered for acceptance and is defined as the following.
 - .1 One day's plant production of more than 4 hours where approved changes to the following criteria have not occurred:
 - .1 Job Mix Formula
 - .2 Pavement Density Requirement
 - .3 Project
 - .2 A change in any one of the above may require a new Lot designation.
 - .1 One day's plant production of less than 4 hours will be dealt with at the Consultants option, as follows:
 - .1 The material will be added to the previous day's Lot if the criteria specified in (i) remains the same or,
 - .2 The material will be added to the next day's Lot with the same criteria specified in (i) or,
 - .3 If it is the last time the mix is produced with these criteria then the production will be designated as a Lot.

- .3 If the Consultant suspects a portion of a Lot is substandard, he may order extra testing to define the area and severity of the deficiency. A new Lot will be designated for this portion if this extra testing indicates the mix is subject to unit price adjustment or rejection.

.5 Rejection Limit

- .1 Density and Actual Asphalt Content - Rejection Limit for Density and Actual Asphalt Content is the limiting value of the Lot Mean beyond which a Lot is rejected and not paid for as shown in Tables 3.50 A, and 3.50 B.
- .2 Gradation - Rejection limit for gradation is the limiting value of the Lot Mean beyond which a Lot is rejected and not paid for as shown in Table 3.50 E.

.6 Lot Mean and Range

- .1 The Lot Mean is the arithmetic mean of a set of 5 or more test results constituting the sample for the Lot. The Range represents the difference between the highest and lowest values within a set of test results.

.7 Stratified Random Sample

- .1 A Stratified Random Sample is a set of test measurements taken one each from 5 or more separate (stratified) areas or segments within a Lot in an unbiased way.

.8 Sublot

- .1 A Sublot is a portion of a Lot that is one paver width wide and 100 m long on which the calculation for Smoothness and assessment of Workmanship and Obvious Defects are based.

.9 Alberta Transportation Test Procedures

- .1 Test methods designated in these specifications as "ATT" or "TLT" refer to Alberta Transportation Tests.

.10 Managed Quality Assurance (MQA)

- .1 Within this specification, acceptance testing shall be applied using Managed Quality Assurance (MQA) practices. With MQA, certain quality control test results provided by the Contractor may be used in place of corresponding quality assurance test results, as a basis for acceptance and payment. The Lots for which quality control test results are used for acceptance and payment will be at the discretion of the Consultant.

.11 QC Acceptance Lot

- .1 A Lot chosen by the Consultant in which acceptance testing for asphalt content and gradation is based upon the Contractor's quality control test results and for which no corresponding quality assurance test results are available. All other quality assurance testing as outlined in this specification will remain the responsibility of the Consultant. Quality assurance test results, when available, shall replace any quality control test results used for material acceptance.

.12 QA Acceptance Lot

- .1 A Lot in which all acceptance testing is conducted by the Consultant using quality assurance test procedures as outlined in these specifications. The number and selection of QA Acceptance Lots shall be determined as follows:
- .1 First two Lots of production for each Mix Type used, except for Mix Type S1 in which case the first Lot shall be used, and;
 - .2 Minimum of one additional Lot per 60 000 tonnes, or portion thereof, of total ACP contract tender tonnage and;
 - .3 One additional Lot of top lift production, for each Mix Type, if two or more lifts are specified and;
 - .4 Any additional Lot(s) chosen by the Consultant.

Part 2 Products

2.1 MATERIALS

.1 Asphalt

- .1 "PG 52-34" Asphalt Cement Grade will be used on Highway 93A.

.2 Aggregate

- .1 The Contractor shall produce crushed aggregates in accordance with Section 31 05 16, Aggregate Material, for the Designation and Class of material specified.

.2 The use of a Reclaimed Asphalt Pavement (RAP) is not permitted for this project

.3 Interim Lane Markings

- .1 The Contractor shall supply interim lane marking paint and glass beads from the list of approved products on the Alberta Transportation Products List.
- .2 The Contractor has the option of supplying reflectorized temporary pavement markers or self-adhesive reflectorized pavement marking tape. Acceptable temporary pavement markers are shown on the Alberta Transportation Products List.

2.2 ASPHALT MIX DESIGN AND JOB MIX FORMULA

.1 Responsibility for Mix Design

- .1 Preparation and submission of asphalt mix designs for Consultant verification and approval are the responsibility of the Contractor. The Contractor shall use Professional Engineering services and a qualified testing laboratory licensed to practice in the Province of Alberta, to assess the aggregate materials proposed for use and to carry out the design of the asphalt mixture. The design testing laboratory shall have obtained pre-qualification status from Parks Canada in the category of Mix Design - Marshall.
- .2 All costs incurred in mix design formulation are the responsibility of the Contractor. Shipping costs for samples sent to the Consultant for verification and approval are the responsibility of the Contractor.

.2 Requirements for Mix Design

- .1 Asphalt mix designs shall follow the Marshall method of Mix Design as described in design procedure TLT-301. The mix design, at the Design Asphalt Content, shall meet the requirements in Table 3.50.3.2 for the Asphalt Concrete Mix Type specified, and the following.
- .2 All mixes shall be evaluated for moisture susceptibility in accordance with AASHTO test procedure T-283, Resistance of Compacted Bituminous Mixture to Moisture Induced Damage, using either gyratory or Marshall compacted specimens. All specimens shall be formed using the same procedure. All mix design submissions shall include the test results as outlined in test procedure T-283, including the visual estimate of the degree of moisture damage.
- .3 The target minimum value for Tensile Strength Ratio (TSR) shall be 75%. Mixes with a TSR value meeting the target minimum will be considered suitable for mix production and will not require the use of a liquid anti-strip additive. In such case, the Contractor may, at his option, elect to still use an anti-strip additive. All costs associated with the use of an anti-strip additive in these cases shall be at the Contractors expense, and no separate or additional payment will be made by Parks Canada.
- .4 Mixes with a TSR value less than the target minimum shall be treated with a liquid anti-strip additive at an additive rate of not less than 0.3% and not greater than 0.5% by weight of binder, and re-tested for moisture susceptibility. The treated mix will be considered suitable for mix production if the TSR value is 60% or higher, and is improved over the untreated TSR value. If the TSR value for the treated mix is less than 60% or less than the untreated TSR value, the mix will be considered unsuitable and shall not be used for mix production.
- .5 Liquid anti-strip additives acceptable for use are listed on the Alberta Transportation Products List. Warm Mix Asphalt (WMA) chemical products which display anti-stripping characteristics and are listed on the Alberta Transportation Products List will be treated as a liquid anti-strip additive for payment purposes.

- .6 When a liquid anti-strip additive is used, the Contractor shall include the following information with the mix design submission:
 - .1 Full details on the type of liquid anti-strip additive to be supplied, including product name, product manufacturer/supplier
 - .2 Additive rate
 - .3 TSR values for the treated and untreated mixes
 - .4 The proposed method for incorporating the additive into the plant produced mix
- .7 When the liquid anti-strip additive is added to the asphalt cement at the mixing plant, a separate pumping and metering system calibrated and electronically interlocked with the operating controls of the mixing plant shall be used. The Contractor shall have the necessary procedures in-place to safely sample the treated asphalt including, where practicable, an in-line valve and sampling system.
- .8 Where moisture susceptibility test results indicate that the use of a liquid anti-strip additive is required, measurement of liquid anti-strip additive incorporated into the mix will be on a per kilogram basis. The Contractor shall supply the Consultant with a copy of all invoices or bills of lading for the anti-strip additive.
- .9 Payment for liquid anti-strip additive will be made at the rate shown in the Special Provisions.
- .10 This payment will be full compensation for the supply and incorporation of the anti-strip additive into the asphalt mix; including all labour, equipment, tools and incidentals necessary.

Table 3.50.3.2 Asphalt Concrete Mix Types and Characteristics

Mix Type	Aggregate Criteria			Marshall Mix Design Criteria						
	Top Size (mm) (Class for Des. 1 Aggregate)	% MF. -5000 (min) Note 1	% Fractures +5000 (2 faces) (min)	Marshall Stability N (min)	No. of Blows	Flow (mm)	Air Voids (%)	VMA % (min) by % Air Voids		Voids Filled with Asphalt %
								3.5	4.0	
H1	16.0	75	98 (one face) 90	12000	75	2.0 to 3.5	Note 3	13.0	13.5	65-75
H2	12.5	70	80	11500	75	2.0 to 3.5	Note 3	13.5	14.0	65-75
M1	12.5	50	60	8000	75	2.0 to 3.5	Note 3	13.5	14.0	65-75
L1	12.5	Note 5	60	5300	50	2.0 to 4.0	Note 3.4	13.5	14.0	65-78
S1	10.0	Note 5	70	5300	Note 2	2.0 to 4.0	Note 3	14.5	15.0	65-78
S2	10.0	75	90	10000	75	2.0 to 3.5	Note 3	14.5	15.0	65-78

S3	25.0	Note 5	70	10000	75	2.0 to 4.0	Note 3	11.5	12.0	65-78
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Design Air Voids	Minimum Theoretical Film Thickness Requirements (µm)	
	Mix Types H1, H2, M1	Mix Type L1, S2, S1 (note 7)
4.0 and 3.9	6.0	6.5
3.7 and 3.8	6.1	6.6
3.5 and 3.6	6.2	6.7
3.3 and 3.4 (L1 for Community Airports Only)	-	6.8
3.0, 3.1, and 3.2	-	6.9

Note 1 – The Percentage of Manufactured Fines in the -5000 Portion of the Combined Aggregate.

Note 2 – Use the same number of blows as for the surface course or 50 blows if used as a surface course.

Note 3 – The Design Air Voids shall be chosen as the lowest value, within the range of 3.5 to 4.0% inclusive, such that all other mix design criteria are met.

Note 4 – Air Void limits listed in Note 3 shall be reduced by 0.5% for community airports. VMA at 3.0% Air Voids shall be a minimum of 13.0%. A 300-400A asphalt is normally used for community airports.

Note 5 – All fines manufactured by the process of crushing shall be incorporated into the mix.

Note 6 – Theoretical Film Thickness shall be as follows, depending on the specified Mix Type and Design Air Voids. The Theoretical Film Thickness value shall be established in accordance with TLT-311.

Note 7 – S1 requirement only for a surface course.

.3 Verification of Mix Design

.1 The Contractor shall submit the mix design to the Consultant for verification and acceptance. The Contractor's submission shall include the following information:

- .1 Aggregate source name(s) and location(s).
- .2 Additive rate
- .3 TSR values for the treated and untreated mixes
- .4 The proposed method for incorporating the additive into the plant produced mix
- .5 The percentage by mass of each aggregate to be used in the mixture.
- .6 The mix design gradation of the combined aggregate.

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- .7 All Marshall Mix Design characteristics, including graphs used in arriving at the final mix design, the bulk specific gravity of the combined aggregates, theoretical maximum specific gravities, and the asphalt absorption of the combined aggregates.
 - .8 Identification of each asphalt supplier by name, location and types and grades of asphalt to be supplied.
 - .9 Percent uncompacted voids (Fine Aggregate Angularity) of loosely compacted minus 2500 portion of the combined aggregate in accordance with TLT-125. No minimum value specified.
 - .10 For each asphalt supplied, asphalt specific gravity and recommended mixing and compaction temperatures for the preparation of design specimens.
 - .11 Voids table to include Air Voids, VMA and Voids Filled with Asphalt for various asphalt contents (0.1 % increments) and bulk densities (increments of 5 kg/m).
 - .12 Mix design submissions using RAP shall include the RAP source name(s) and location(s), all RAP asphalt content and gradation test results, the bulk specific gravity of the RAP aggregate, the percentage by weight of RAP to be used in the mixture, and, when required, all RAP rheological test results, the design rheology and all blending charts used.
-
- .2 The Consultant will require up to 5 working days from the time of receipt of the mix design to complete the design verification.
 - .3 Where required by the Consultant for any change in the nature or sources of the aggregates or RAP, or where a new mix design is desired by the Contractor, the Contractor shall provide a separate and complete mix design. This new mix design shall be subject to verification and acceptance by the Consultant.
 - .4 The Consultant may, at any time, require the Contractor to provide representative samples of each of the aggregate components, asphalt cement and RAP for verification purposes. A sufficient quantity of each component shall be provided to result in a 100 kg sample of combined aggregate at design proportions. The Consultant will require up to 5 working days from the time of receipt of the sample to verify the mix design. The cost of such mix design verification will be borne by Parks Canada.
 - .5 The Contractor shall not produce any asphalt mix prior to receiving the Consultant's written notice that the mix design has been verified. Any mix produced prior to receiving such notice will not be accepted.
 - .6 The aggregate proportioning, target gradation and asphalt content for the accepted mix design will then be the Design Mix Formula and will become the Job Mix Formula for the start in production of asphalt mix.
 - .7 The Contractor shall be responsible for producing mixes which conform with the

Specifications.

- .4 Variation from the Job Mix Formula
 - .1 Once the Job Mix Formula has been established, no alteration will be permitted unless approved by the Consultant.
 - .2 The Lot Mean Marshall Air Voids, as determined by the Consultant, shall not vary from the air voids in the approved mix design by more than 0.5%.
 - .3 If the sum of any accepted alterations to the Job Mix Formula is in excess of any one of the following limits away from the Design Mix Formula, a new mix design is required.
 - .1 $\pm 5\%$ passing the 5 000 μm sieve.
 - .2 $\pm 1.0 \%$ passing the 80 μm sieve.
 - .3 $\pm 0.3 \%$ asphalt content.
 - .4 Unless otherwise approved by the Consultant, the Contractor may not request more than three alterations to the Job Mix Formula without the provision of a new mix design.
 - .5 Any change to the Job Mix Formula shall not result in a Theoretical Film Thickness value less than that specified in Table 3.50.3.2 Asphalt Concrete Mix types and Characteristics for the applicable Design Air Voids.

2.3 SAMPLING AND TESTING

- .1 General
 - .1 During the progress of the Work, tests will be carried out on materials and workmanship in order to ensure compliance with the requirements of the Specifications.
 - .2 Where it is required in these specifications that the Contractor submit samples of materials or mixtures to the Consultant for approval, these samples shall be submitted in sufficient time for proper testing.
 - .3 The Consultant's approval of any materials or mixture shall in no way relieve the Contractor from his obligation to provide materials, mixtures and workmanship in accordance with the Specifications.
 - .4 Where specified, random sampling procedures shall be followed, and where no specific random sampling procedure is specified the sampling procedure shall be as identified by the Consultant in the case of acceptance testing and by the Contractor in the case of quality control testing.
 - .5 The Consultant shall have access to the Work at all times for taking samples. The

Contractor shall provide any assistance necessary for taking samples and shall reinstate pavement layers or other structures to the satisfaction of the Consultant at the positions where samples have been taken. Compensation for providing assistance with sampling and for reinstatement where samples are taken shall be included in the unit price bid for the various items of Work tested and no separate payment will be made.

- .6 The Contractor shall provide, at his own expense, sampling stands, sampling devices and other facilities which the Consultant may require to safely obtain representative samples of the item being produced.
- .7 When required, the Contractor shall provide and prepare, to the satisfaction of the Consultant, a suitable site for the parking of a mobile laboratory trailer. The Contractor shall provide power to the mobile laboratory trailer, at his own expense.

.2 Methods of Testing For Acceptance and Appeal Testing

- .1 Unless otherwise specified, the latest edition of the following standard Alberta Transportation test methods (ATT) shown in Table 3.50.4.2 will be used to determine material characteristics.

Table 3.50.4.2 – Test Methods on Managed QA Projects

	Test Description	Test Method
1	Sampling Mixes	ATT-37
2	Coring	ATT-5
3	Extraction	ATT-12
4	Correction Factor, Extracted Asphalt Content	ATT-12 Part III
5	Percent Fracture	ATT-50
6	Sieve Analysis	ATT-26
7	Density, Immersion Method, Waxed Asphalt Concrete Specimens	ATT-6
8	Density, Immersion Method, Saturated Surface Dry Asphalt Concrete Specimens	ATT-7
9	Density, Using Automated Vacuum Sealing Method	AASHTO T331
10	Voids Calculation, Asphalt Concrete Specimens	ATT-36
11	Percent Compaction, Asphalt Concrete Pavement	ATT-67
12	Forming Marshall Specimens, Field Method	ATT-13
13	Moisture Content, Oven Method Asphalt Concrete Mixes	ATT-15
14	Smoothness of Pavements, Profilograph Method	ATT-59
15	Stratified Random Test Sites for A.C.P Projects	ATT-56
16	Appeal Testing, Asphalt Content, Density and Gradation	ATT-68
17	Asphalt Content, Ignition Method	ATT-74
18	Correction Factor, Ignition Asphalt Content	ATT-74 Part II
Additional Test Methods for QC Acceptance Lots Only		
19	Asphalt Content	AASHTO T164, T287 or ATT-12 or ATT-74

Notes:

- In all test methods used as reference in this specification, metric sieves as specified in Canadian General Standards Board Specification 8-GP-2M shall be substituted for any other specified wire cloth sieves in accordance with Specification 3.2, Aggregate Production and Stockpiling.
- In all cases the latest amendment or revision current at the closing date of the Tender is implied when reference is made to one of the above standards in the Specification.

.3 Quality Control Testing.

- .1 Quality control testing is the responsibility of the Contractor throughout every stage of the Work from the crushing and production of aggregates to the final accepted product. Tests performed by the Consultant will not be considered to be quality control tests. The Contractor shall provide and pay for equipment and qualified personnel to obtain all quality assurance core samples and perform all quality control testing necessary to determine and monitor the characteristics of the materials produced and incorporated into the Work, and the final product produced.
- .2 Test methods, sampling and minimum frequency of testing are described in Subsection 3.50.4.2, Methods of Testing For Acceptance and Appeal Testing, and Table 3.50.4.3, Quality
- .3 Control Testing Requirements. The Consultant may require an increase in the frequency of any quality control test which has a specified minimum frequency. The Contractor shall arrange and pay for any additional tests required by the Consultant.
- .4 Results of all quality control tests shall be submitted to the Consultant as they become available. In addition, the quality control test results for mix asphalt content and aggregate gradation shall be provided to the Consultant no later than 12:00 noon of the day following placement.
- .5 The Contractor shall bear the cost of all consulting services retained by him. The Contractor shall be totally responsible for production of aggregate and mixes that meet all the specified requirements.

Table 3.50.4.3 – Quality Control Testing Requirements – Managed QA Testing Projects

TEST	STANDARD	MINIMUM FREQUENCY
AGGREGATE PRODUCTION		See Specification 3.2
ASPHALT MIX PLANT		
Calibration	ATT-17	Once per project or as required
Inspections	ATT-16	(2)
SAMPLES		
Asphalt Cement	ATT-42	See Specification 5.7
Tack, Prime, and Fog Materials	ATT-42	See Specification 5.7
Cold Feed Aggregate	ATT-38	
Mix	ATT-37	(2)
QA Cores – Stratified Random Test Sites Chosen	ATT-56	One per segment for each Lot.

By The Consultant	ATT-5	One per segment for selected Lots as directed by the Consultant.
i) QA Cores for Pavement Density ii) QA Cores for Asphalt Content and Gradation	ATT-5	
TESTS WITH SPECIFIED MINIMUM FREQUENCIES		
Mix Asphalt Content	AASHTO T-164, T287 or ATT-12 or ATT-74	(2)
Correction Factors	ATT-12, Part III or ATT-74, Part II	As Required
Mix Moisture Content	ATT-15	(2)
Aggregate Sieve Analysis	ATT-26	(2)
Pavement Segregation	Segregation Rating Manual	Each Lot
TESTS WITH NO SPECIFIED MINIMUM FREQUENCIES		
Field Formed Marshall Briquettes	ATT-13	(1)
Density Immersion Method, Saturated Surface Dry	ATT-7	(1)
Void Calculations, Cores or Formed Specimens	ATT-36	(1)
Temperatures	ATT-30	(1)
Percent Compaction, Cores or Nuclear Density	ATT-67, ATT-5 or ATT-11	(1)
Random Test Site Locations	ATT-56	(1)
Correction Factors, Nuclear Moisture-Density Measurement	ATT-48	(1)
Pavement Smoothness	ATT-59	(1)

(1) Minimum Frequency not specified.

(2) When a Lot has eight hours of plant production or more, a minimum of four plant checks plus four asphalt contents and four sieve analysis of the combined aggregate (any combination of cold feed, extraction or ignition) are required. When a Lot has less than eight hours of plant production, these tests shall be performed once for every two full hours of plant production.

.4 Acceptance Sampling and Testing.

.1 General

- .1 Within this specification, certain requirements, limits and tolerances are specified regarding the quality of materials and workmanship to be supplied. Compliance with these requirements where so specified, shall be determined by statistical testing as described in this Section.
- .2 Acceptance testing is the responsibility of the Consultant except for Lots designated by the Consultant as QC Acceptance Lots in which case the Contractor's quality control test results for asphalt content and aggregate gradation only, may be used towards determining conditional material acceptance.
- .3 The Contractor shall provide to the Consultant all quality assurance density cores and any additional cores requested by the Consultant for quality assurance testing for asphalt content and gradation by 12:00 noon of the day following placement, unless otherwise permitted by the Consultant. Prior to the Contractor obtaining the cores, the Consultant

may provide the Contractor with new or different random sample locations. The Consultant may have the Contractor obtain cores for quality assurance testing at any time throughout the project for any Lot. All cores provided to the Consultant shall be in their original condition. Core preparation or sawing shall be done by the Consultant.

- .4 All costs associated with pavement coring for both quality control and quality assurance testing shall be the responsibility of the Contractor.
- .5 Initial acceptance testing will be performed free of cost to the Contractor. The Contractor shall be responsible for the cost of all Quality Assurance testing performed on material that is used to replace or overlay material that has been previously rejected.
- .6 The Contractor shall be responsible for the cost of all Quality Assurance re-testing performed following attempts to improve smoothness or to remove bumps or dips.
- .7 After all quality control tests for the Lot are reported to the Consultant, the Consultant will provide the Contractor with a copy of the results of acceptance tests within one working day of their availability.
- .8 If the Consultant determines that certain test results are faulty due to testing equipment malfunction, improper testing procedures or calculations, he will replace the faulty tests with new tests.
- .9 If the testing equipment malfunction, improper testing procedures or calculations were on the part of the Consultant, the Contractor shall be reimbursed \$50 per location for obtaining cores.

.2 Acceptance Sampling and Testing Procedures

.1 Pavement Sampling for Density, Asphalt Content and Gradation

- .1 Pavement sampling will be done using stratified random sampling procedures. A minimum of 5 tests per Lot will be selected as follows:
 - .2 The Lot will be divided into 5 or more segments of approximately equal quantity.
 - .3 In each segment a test site will be located by using random numbers to determine the longitudinal distance from the end of the segment and the lateral distance from the edge of the segment. In no case will a lateral distance be less than 0.5 m from the shoulder or 0.3 m from any other edge of a mat except when matching mats, in which case the test site may be within 0.3 m of the joint.
 - .4 For lifts of 20 mm or less, samples for asphalt content and gradation may be obtained by the Consultant using the Sampling

Mix Behind Paver method described in ATT-37. If sufficient numbers of mix samples cannot be obtained in this manner, stratified random core samples shall be taken by the Contractor as determined by the Consultant in order to perform the minimum five tests per Lot.

- .5 On Lots designated by the Consultant as QC Acceptance Lots, material sampling for quality control testing of asphalt content and gradation may consist of cold feed aggregate or loose mix or core samples as outlined in ATT-37, ATT-38 or ATT-56.

- .2 Asphalt Mix Sampling

- .1 Sampling of the asphalt mixture for Marshall compaction comparison will be carried out by the Consultant using the procedures identified in ATT-37.

- .3 Exclusions to Random Sampling

- .1 Random sampling methods will not be applied when the Consultant samples mix behind the paver on lifts of 20 mm or less; nor to small areas such as tapers, approaches, areas of handwork, gores; nor for asphalt mix used for isolated leveling and repair of failed areas; nor for aggregate or asphalt mix chosen for QC Acceptance Lot testing.

- .5 Aggregate Gradation Requirements

- .1 The following requirements apply to asphalt concrete pavement material in all lifts except preliminary leveling and those Lots designated as QC Acceptance Lots.
 - .2 Price adjustments for aggregate gradation variation will be based on the variation of the Lot Mean Gradation from the Job Mix Formula tolerance, for each size, as shown in Table 3.53 D and the corresponding adjustment points as shown in Table 3.53 E
 - .3 For lifts greater than 20 mm in thickness, the Lot Mean Gradation will be determined using the sieve analysis of core samples. For lifts 20 mm or less, the Lot Mean Gradation will be determined using the sieve analysis of mix and/or core samples.
 - .4 When the Lot Mean Gradation is outside the Job Mix Formula tolerance, the penalty assessment will be \$0.04 per tonne for each Mean Adjustment Point within the limits shown in Table 3.53.2.2A (excluding the requirements of Table 3.53.2.2B). When the Lot Mean Gradation is outside the limits of Table 3.53.2.2A (excluding the requirements of Table 3.53.2.2B) the penalty assessment will be \$0.40 per tonne for each Mean Adjustment Point outside those limits, regardless of the Job Mix Formula tolerance.
 - .5 When the Lot Mean Gradation for all sieve sizes is within the Job Mix Formula

tolerance and within the limits of Table 3.53.2.2A (excluding the requirements of Table 3.53.2.2B) and individual test results for each sieve size are within the allowable range shown in Table 3.53 D, a bonus of \$0.20 per tonne will be applied.

.6 Pavement Segregation Requirements

.1 General

- .1 The finished surface of the top lift of ACP shall have a uniform texture and be free of segregated areas.

.2 Classifying Pavement Segregation

- .1 A segregated area is defined as an area of the pavement where the texture differs visually from the texture of the surrounding pavement. For the purposes of classifying pavement segregation, only segregated areas greater than 0.1m² and centre-of-paver streaks greater than 1 m in length will be considered. Moderate or severe segregated areas which do not meet these size parameters will be considered obvious defects. Pavement segregation will be classified as follows:
- .1 Slight - The matrix, asphalt cement and fine aggregate is in place between the coarse aggregate. However, there is more stone in comparison to the surrounding acceptable mix.
- .2 Moderate - Significantly more stone than the surrounding mix; moderately segregated areas usually exhibit a lack of surrounding matrix.
- .3 Severe - Appears as an area of very stony mix, stone against stone, with very little or no matrix.
- .4 Centre-of-Paver Streak - Appears as a continuous or semi-continuous longitudinal "streak" typically located in the middle of the paver "mat".

.3 Inspections for Pavement Segregation

.1 Inspections by the Contractor

- .1 The Contractor shall perform a daily inspection of the paving operations on all lifts of pavement to identify any instances of pavement segregation. If segregation is evident, the Contractor shall take immediate corrective action to his operations to prevent any further occurrence of segregation.

.2 Inspections by the Consultant

.1 Inspections During Construction

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- .1 The Consultant shall inspect the lower lifts of pavement to identify any instances of pavement segregation. If segregation is evident, the Consultant shall immediately notify the Contractor so that corrective action can be taken to prevent further occurrence of segregation.
 - .2 The Consultant shall also inspect the top lift of pavement. Typically, each pavement Lot would be inspected, as soon as possible after the Lot is placed. During the inspection(s) of the top lift, the Consultant will identify and record any areas of moderate and severe segregation and any areas of center-of-paver streak. Areas requiring repair shall be marked. The Consultant will provide the Contractor with a written assessment (location and severity) of the segregated areas as soon as possible following each inspection.
- .2 Inspection Following Construction
- .1 The Consultant shall conduct a second inspection of the top lift, normally 2 weeks after the completion of paving work. During this inspection, the Consultant will identify and record any areas of slight, moderate and severe segregation and any areas of centre-of-paver streak which were not identified in the inspections during construction. The Consultant will provide the Contractor with a written assessment (location and severity) of the segregated areas as soon as possible following this inspection.
 - .2 Requests by the Contractor to have the second inspection conducted on portions of the Work prior to the completion of all paving work will be considered subject to the availability of the Consultant's engineering staff and seasonal weather conditions. This is meant to apply for projects that are not anticipated to be completed prior to winter shut down or where the Contractor has moved his paving operations offsite for an extended period of time. For such inspections the Contractor will be invoiced by Parks Canada at a rate of \$750 per inspection to cover the extra mobilization and travel costs associated with this work.
- .4 Repairing Pavement Segregation
- .1 Pavement segregation identified during the inspection performed 2 weeks after the completion of paving operations will not require repair. However, this shall not relieve the Contractor from his responsibility to repair any obvious defects, deteriorated repairs or failures which become evident within the warranty period.

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- .2 Pavement segregation identified in the inspections performed during construction shall be repaired by the Contractor at his expense and in accordance with the following:
 - .1 Moderate and severe segregation in the top lift of pavement and on entrances and intersections shall require repair.
 - .2 For entrances and the portion of intersections outside the through travel lanes and shoulders, areas of moderate and severe segregation shall be repaired in accordance with the methods of repair listed for moderate segregation. Intersections and entrances shall also be neatly shaped, smooth and free of surface defects and depressions.
 - .3 Slight segregation on any lift of pavement will not require repair.
 - .4 Moderate segregation on lower lifts will not require repair.
 - .5 Severe segregation on lower lifts will only require repair in instances where, in the opinion of the Consultant, the segregated area will affect the long term structural integrity of the pavement structure. Such repair will not be required in instances where the Consultant determines that the paver screed is "dragging" due to distortion of the existing surface.
 - .6 Only moderate and severely segregated centre-of-paver streak on the top lift of pavement will require repair.
 - .3 The following methods of repair are pre-approved:
 - .1 Moderate Segregation - The Contractor has the option of using a slurry patch or a hot mix patch.
 - .2 Severe Segregation - The Contractor has the option of removal and replacement or overlay.
 - .4 Any other methods of repair proposed by the Contractor will be subject to the approval of the Consultant with the exception that the application of asphalt (by distributor, hand spraying, squeegeeing, etc.) shall not be permitted as a method of repair under any circumstances.
 - .5 Repairs for segregation using an overlay shall be for the entire pavement width. Repairs for segregation using removal and replacement shall be for the full lane width, full lane width and shoulder or the shoulder only as applicable, depending on the extent of the segregated area. The full depth of the asphalt lift shall be removed and replaced with new ACP using an appropriate paver and cold milling equipment. All ACP material used for overlay and removal and replacement repairs shall have a tack coat applied prior to placement.
 - .6 The Consultant will mark out the area of repair. The "marked area" shall

extend a minimum of 0.5 m beyond the segregated area. For centre-of-paver streak, the "marked area" shall extend a minimum of 100 mm laterally and 0.5 m longitudinally beyond the streak.

- .7 All repairs shall be regular in shape and finished using good workmanship practices to provide an appearance suitable to the Consultant. Traffic shall be kept off all repairs for a sufficient period of time to ensure that tracking does not occur.
- .8 All hot mix and other repairs for which compaction is normally required shall be properly compacted.
- .9 In the event repairs cover existing roadway lines or markings, the Contractor shall reinstate the lines and markings at his expense and to the satisfaction of the Consultant.
- .10 Repairing pavement segregation will not affect the assessment of segregation payment adjustments.
- .11 Repairs shall be completed during construction or shortly after construction, except when prevented by inclement weather or seasonal shutdown. In these cases, the Contractor shall complete the repairs prior to June 15 of the following year.

.7 Appeal of Acceptance Test Results and Appeal Testing

.1 Density, Asphalt Content and Gradation

- .1 Appeal testing will be done using ATT-68. The Contractor may appeal the results of acceptance testing of Density, Asphalt Content or Gradation for any rejected or penalized Lot only once. Appeals will only be considered if cause can be shown. Quality Control test results for density which is provided to the Consultant subsequent to the Contractor's receipt of the quality assurance test results for that Lot will not be considered when evaluating cause for an appeal. The appeal shall be for all tests within the Lot, and there will be no appeal allowed for single tests within a Lot.
- .2 Any attempt to improve density on the appealed Lot after the Consultant has tested the Lot for acceptance shall void the appeal and the original test results will apply.
- .3 The following procedures will apply for an appeal:
 - .1 For Gradation and Asphalt Content appeals, the Contractor shall serve notice of appeal to the Consultant, in writing, within 48 hours of receipt of the test results. For all other appeals notice shall be served to the Consultant, in writing, within 24 hours of receipt of the test results.
 - .2 The Consultant will arrange and pay for an independent testing

laboratory certified to operate in the Province of Alberta, to perform the appeal testing. The personnel employed or testing laboratory retained by the Contractor for quality control testing on the project will not be used for appeal testing.

- .3 The Consultant will determine the number and location of the new tests for each segments. The Contractor shall sample the pavement at such locations and provide the samples to the Consultant.
- .4 For appeals other than gradation appeals, the single high and single low test results from the old Lot will be rejected and the remaining test results will be added to the results of the new tests. A new Lot Mean for the test results will be determined and used for acceptance and unit price adjustment. For gradation appeals, all tests from the old Lot will be retained and averaged with the new appeal tests. A new Lot Mean and Range for all tests will be determined and used for acceptance and unit price adjustment. The new values, thus determined, in all cases, will be binding on the Contractor and Parks Canada.

.2 Segregation Rating

- .1 The Contractor may appeal the rating of segregated areas classified as moderate or severe in any portion of the Work or the entire project for lane.km(s) that are not in bonus.
- .2 The following procedures will apply for an appeal:
 - .1 The Contractor must serve written notice of the appeal to the Consultant within 7 days of receipt of the final segregation assessment. The written notice shall detail the location(s) and nature of the appeal.
 - .2 The Consultant will determine a representative sample of the portion of the Work appealed, and will reassess this area. Generally, this reassessment will be completed within 2 weeks of the Consultant's receipt of the written notice of appeal. Based on the reassessment of the representative sample, the Consultant will determine whether or not a reassessment of the entire appealed work is necessary.

.3 Payment of Appeal Testing Costs for Asphalt Content, Smoothness or Gradation

- .1 If the new results show that a penalty no longer applies, then sampling and testing costs for the appeal procedures for that Lot will be the responsibility of Parks Canada. Furthermore, in such cases the Contractor shall be reimbursed sampling costs at the rate of \$50.00 per location.
- .2 If the new results verify that any unit price reduction or rejection remains

valid for that Lot, then the Contractor will be invoiced by Parks Canada for the testing costs for the appeal procedures at the following rates:

- .1 Asphalt Content: \$2,000.00 for the first appeal Lot and \$1,000.00 for all subsequent Lots if an asphalt correction factor is not required.
- .2 Gradation: \$1,000.00 per appeal.
- .3 Profilograph: \$150.00 per hour (travel time, testing time and standby time).
- .4 Payment of Appeal Testing Costs for Density
 - .1 If the new results indicate that the new Lot Mean for Density is no longer in a penalty situation and that the Lot Mean has increased by more than 0.8%, then the costs of sampling and testing for the appeal procedures shall be the responsibility of Parks Canada. Furthermore, in such cases the Contractor shall be reimbursed sampling costs at the rate of \$50.00 per location.
 - .2 If the new results indicate that the Lot Mean for Density is either in a penalty situation or has not increased by more than 0.8%, then the Contractor shall be invoiced by Parks Canada for the sampling and testing costs for the appeal procedures at a rate of \$250.00 per Lot appealed.
- .5 Payment of Appeal Testing Costs for Density
 - .1 If a reassessment of the appealed work results in a change in the original rating, the revised rating will apply.
 - .2 If the overall payment adjustment for segregation is reduced as a result of an appeal, the cost of the reassessment will be borne by Parks Canada.
 - .3 If there is no change to the overall payment adjustment for segregation or if the overall payment adjustment is increased, the Contractor will be charged an amount of \$3,500.00.

2.4 CONSTRUCTION

- .1 Equipment
 - .1 General
 - .1 Equipment shall be designed and operated to produce an end product complying with the requirements of this specification.
 - .2 Mixing Plant
 - .1 Mixing plants shall be operated in accordance with the Manufacturer's recommendations and shall be calibrated prior to commencing

production of the specified mix. The Contractor shall provide the Consultant with a certificate of calibration which certifies that the plant has been calibrated to produce a uniform mixture in accordance with the Job Mix Formula.

- .2 Asphalt binders used for water injection foaming shall not include anti-foaming additives.

- .3 Mix Production

- .1 Aggregate and asphalt shall be combined to produce a uniform mixture of specified gradation at an asphalt content in accordance with the approved Job Mix Formula and in which all particles of aggregate are uniformly coated.

- .2 Unless otherwise specified, the maximum mixing temperature for all grades of asphalt shall be 155° C, or for Performance Grade specified asphalt, as recommended in writing by the asphalt supplier.

- .3 Plant emissions shall not exceed the limits set by Alberta Environment.

- .2 Preparation of Existing Surface

- .1 General

- .1 Failed areas in existing surfaces shall be repaired as directed by the Consultant. Areas requiring repair will be identified by the Consultant in consultation with the Contractor.

- .2 Before the asphalt mix is placed, dirt and other objectionable material shall be removed from the surface to be paved, by brooming or other methods and a tack coat or prime coat shall be applied in accordance with Section 32 12 13.23 Asphalt Prime Coats and Section 32 12 13.16 Asphalt Tack Coats.

- .3 Existing fillets and ramps at approaches to railway crossings and bridge structures, or adjacent to paved surfaces or other structures, shall be removed to the depths shown on the Drawings or as directed by the Consultant. The removed material shall be disposed of and the exposed surfaces shall be prepared as directed by the Consultant.

- .4 Contact edges of existing mats and contact faces of curbs, gutters, manholes, sidewalks and bridge structures shall be coated with a thin film of liquid asphalt material before placing the asphalt mix.

- .2 Preliminary Leveling

- .1 Areas that require preliminary leveling will be as shown on the Drawings or as identified in the field by the Consultant. Generally, areas that show depressions, rutting or other deformations to a depth of 15 mm or greater will be designated by the Consultant for preliminary leveling.

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- .2 Pavement lifts that are specified, or shown on the Drawings, with designated lift thickness less than 20 mm shall be considered as preliminary leveling and shall be placed using a paver. Preliminary leveling not specified to be placed using a paver lift shall be spread using a motor grader or other methods approved by the Consultant. All of the following shall apply for acceptance:
 - .1 If the material type for preliminary leveling is not specified or shown on the Drawings it shall be the same Designation and Class as specified for the subsequent lift of asphalt concrete pavement;
 - .2 Regardless of how the asphalt mix is spread, a minimum of one pneumatic tired roller shall be used for compaction, and a minimum density of 91.0% of the Marshall density, as determined by the Consultant, is required;
 - .3 Preliminary leveling is intended to be a separate operation and shall not be done as part of the construction of the subsequent lift of asphalt concrete pavement.
 - .3 For the purposes of determining the unit price adjustments listed in Table 3.50 A and lump sum subplot assessments listed in Table 3.50 C, preliminary leveling is not considered to be a lift.
 - .3 Transverse Pavement Joints
 - .1 Transverse joints between existing pavement and ACP placed under this Contract shall be of a vertical butt type, well bonded, sealed and finished to provide a continuous, smooth profile across the joint. This shall include tie-ins to all paved road allowances, median cross-overs, and approaches to bridges and railway crossings. Tie-ins to streets, parking lots and other urban approaches shall be as specified in Contract drawings or by the Consultant in the field.
 - .2 To accomplish this, the existing pavement shall be cold-milled to expose a vertical surface against which new ACP may be placed. The depth of the cold milling shall be equal to the thickness of the final lift. In longitudinal section, the minimum slope of the milled area shall be 200 horizontal to 1 vertical, all in general conformance with Alberta Transportation's Drawing CB6-3.50 M16. In plan, the Contractor shall cut the joint in the following manners:
 - .1 The joint may be cut at 45° to the centreline of the roadway across the full width of each mat; or
 - .2 The joint may be cut at 45° to the roadway centreline across the travel lanes and contiguously at 90° to the roadway centreline elsewhere.
 - .3 For median cross-overs, bridges and railway crossings the joint

shall be cut parallel to the crossing.

- .3 When the existing pavement has been removed in advance of paving the joint area, the Contractor shall construct a smooth taper at the joint area to a slope of at least 50 horizontal to 1 vertical. The taper may be placed on tar paper and shall be removed when paving is resumed as directed by the Consultant. The transverse joint shall be straight and have a vertical face when the taper is removed.
- .4 Unless otherwise noted, the Contractor shall assume ownership of all RAP resulting from cold milling operations and dispose of the material in an approved manner.

.3 Transporting the Asphalt Mix

- .1 Trucks used for transportation of the mix shall be compatible with the size and capacity of the spreading equipment.
- .2 Truck boxes shall be clean, free from accumulations of asphalt mix and foreign material. Excess truck box lubricants such as light oil, detergent or lime solutions shall not be allowed to contaminate the mix, and shall be disposed of in an environmentally acceptable manner. Petroleum based truck box lubricants shall not be used.
- .3 During transport, the mix shall be completely covered to protect it from precipitation and excessive heat loss by securely fastened waterproofed tarpaulins, unless otherwise approved by the Consultant.

.4 Placing the Mix

- .1 Asphalt mix shall be placed only on dry surfaces.
- .2 Unless otherwise shown on the plans, the asphalt mix shall be placed in the following lift thicknesses:
 - .1 In a single lift when the design compacted total thickness is 70 mm or less.
 - .2 In two or more lifts when the design compacted total thickness is greater than 70 mm. The lift thickness selection shall be determined by the Contractor except that:
 - .1 The maximum thickness of any lift shall be 100 mm.
 - .2 The minimum thickness of a top lift shall be 50 mm.
 - .3 When a total ACP thickness of 80 mm is specified, the thickness of the first lift shall be 30 mm and the final lift shall be 50 mm.
 - .4 When a total ACP thickness of 90 mm or more is specified, the minimum thickness of all lifts except the top lift shall be 40 mm or greater.

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- .3 Lift thickness will normally be designed and expressed in increments of 10 mm.
 - .4 Longitudinal joints will not be permitted between the edges of driving lanes in the final lift of ACP. Longitudinal joints shall be offset a minimum of 150 mm from one lift to the next.
 - .5 Longitudinal and transverse joints shall be vertical butt type, well bonded and sealed, and finished to provide a continuous, smooth profile across the joints. Surplus material at longitudinal joints shall be disposed of in a manner acceptable to the Consultant. Broadcasting surplus material across the mat will not be permitted.
 - .6 All longitudinal joints shall be straight and uniform with no lateral waviness. Any mat contact that is not straight or uniform as determined by the Consultant shall be trimmed by saw-cutting or using some other method acceptable to the Consultant prior to placing the adjacent mat. The material removed shall be disposed of to the satisfaction of the Consultant.
 - .7 Any mat with a contact edge that has deteriorated, cracked or slumped due to improper rolling or vehicle traffic shall be trimmed by saw-cutting or some other method acceptable to the Consultant prior to placing the adjacent mat. The length of contact edge to be trimmed, removed and disposed of will be as determined by the Consultant.
 - .8 If required by the Consultant the contact edge of any mat placed by the Contractor shall be coated with a thin film of liquid asphalt before placing the adjacent mat.
 - .9 When paving is discontinued in any lane, the mat shall be tapered to a slope of 10 horizontal to 1 vertical. The taper may be placed on tar paper and shall be removed when paving is resumed. The transverse joint shall be straight and have a vertical face when the taper is removed.
 - .10 Transverse construction joints from one lift to the next shall be separated by at least 2 m.
 - .11 Where the construction of a top lift of pavement next to a concrete curb section or curb and gutter section will be delayed, the Contractor shall construct a temporary asphalt concrete fillet next to the concrete section in accordance with the Drawings or as directed by the Consultant. These fillets shall be removed when paving is resumed.
 - .12 Placement of ACP adjacent to guardrail shall conform with Alberta Transportation's Typical Barrier Drawing No. TEB 3.56.
- .5 Road Intersections and Entrances
- .1 Road intersections and entrances shall be paved in accordance with the Drawings or as herein described in these specifications.
 - .2 On all road intersections, median cross-overs and residential farm entrances, the

asphalt mix shall be spread by means of a paver. No grader laying will be permitted except for bottom lift or preliminary leveling.

- .3 On all other entrances, the asphalt mix shall be spread by means determined by the Contractor and in a manner acceptable to the Consultant.

.6 Compacting the Mix

- .1 All asphalt mix, including those areas of the mat which are excluded from testing, shall be thoroughly compacted, and after final rolling the finished surface of the mat shall be free from segregation, waves, hairline cracks, and other obvious defects.
- .2 The rollers or drums shall be kept moist with water or non-petroleum based release agents to prevent adhesion. Excess water or release agents shall not be used.
- .3 After final rolling is complete, the Contractor shall ensure that the finished mat has cooled for a minimum period of 2 hours before opening the section to traffic.

.7 Asphalt Mix for Others

- .1 The Contractor shall make available, on request, additional asphalt mix for the use of Parks Canada. The estimated quantity of additional mix is shown in the unit price schedule as "Asphalt Mix for Others." This additional mix will be picked up at the mixing plant by other forces at times that are mutually agreeable to the Contractor and the Consultant.

.8 Interim Lane Markings

- .1 The Contractor shall provide interim lane markings on all newly constructed ACP surfaces, or on tacked surfaces that are to be exposed to traffic overnight.
- .2 When paint is used, the paint shall be the same colour as the permanent markings designed for the Work.
- .3 All paint spots shall be 100 mm wide and 300 mm long, shall be applied lengthwise to the road surface, shall be spaced 15 m apart on centre in tangent sections and 7.5 m apart on curves and shall be completely covered with glass beads at the time of painting.
- .4 When self-adhesive, reflectorized pavement marking tape is used, the spacing shall be the same as is used for paint spots. Tape on lower lifts does not need to be removed prior to placement of the next lift of pavement. If tape is used on the upper lift, it shall be removed immediately prior to painting the permanent lane markings.
- .5 When temporary pavement markers are used, they shall be placed at 25 m intervals on tangent sections and at 15 m intervals on curves. Markers used on the upper lift must remain in place until the permanent markings are applied. Markers used on lower lifts, shall be removed immediately prior to placement of

the next lift of pavement.

.9 Grooved Rumble Strips

- .1 When specified in the Special Provisions, the Contractor shall construct grooved rumble strips as shown on Alberta Transportation's Drawing CB6-3.50M15.
- .2 No grooving will be done across intersections or accesses nor at any other locations specified by the Consultant.
- .3 The grooving shall be applied only to the top lift of the pavement and may be formed by any means which the Contractor may propose and which are acceptable to the Consultant. The Contractor shall remove and repair any grooving placed beyond the limits outlined, at his own expense.

2.5 END PRODUCT ACCEPTANCE OR REJECTION

.1 General

- .1 The Contractor shall provide an end product conforming in quality and accuracy of detail to the dimensional and tolerance requirements of the Specifications and Drawings. Where no tolerances are specified, the standard of workmanship shall be in accordance with normally accepted good practice.

.2 End Product Acceptance

.1 Acceptance at Full or Increased Payment

- .1 Acceptance of any Lot at full or increased payment will occur if it contains no obvious defects and if:
 - .1 The Lot Mean for density of the compacted mix in the Lot is not in penalty or reject according to the criteria outlined in Table 3.50 A.
 - .2 The Lot Mean for Actual Asphalt Content of the mix, is within 0.3 of the Approved Asphalt Content. On QC Acceptance Lots, where quality assurance test results for asphalt content are not available, the Contractor's quality control test results shall be used. Quality assurance test results when available shall replace any corresponding quality control test results.
 - .3 For gradation in QA Acceptance Lots only, full payment will occur if there are no Lot Mean Adjustments for gradation and increased payment will occur if there are no Lot Mean Adjustments and the Maximum Range as shown in Table 3.50 D is not exceeded for any sieve size in the Lot. For gradation in QC Acceptance Lots, consideration is only given to acceptance at full payment. No increased payment will be applied using quality control test results.

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- .2 Acceptance at Reduced or Adjusted Payment
 - .1 Acceptance of any Lot at reduced payment will occur if it contains no obvious defects and if;
 - .1 The quality assurance test results are such that the Lot or Sublot meets with requirements for acceptance at a reduced payment. For asphalt content and aggregate gradation no decreased payment will be applied using quality control test results.
 - .2 The Lot or Sublot is approved in respect of all other requirements.
 - .3 The Contractor has not notified the Consultant in writing that he will exercise his option to repair or remove and replace the Work at his own cost with work meeting the requirements for acceptance at full or increased payment.
 - .4 Individual bumps and dips measuring 12 mm or greater have been repaired.
 - .5 Individual bumps and dips exceeding 8 mm and less than 12 mm which have been designated by the Consultant as unacceptable, have been repaired.
 - .2 Both bonus and penalty adjustments may be made for any Lot in accordance with Section 01 27 00, Measurement and Payment.
 - .3 End Product Rejection
 - .1 If the Lot Mean for Density or Actual Asphalt Content is outside the applicable acceptance limits, then the Lot is rejected automatically, regardless of the values of the other control characteristics.
 - .2 If the smoothness of the top lift of any Sublot is outside the acceptance limit, then the Sublot is rejected automatically, regardless of the values of the other control characteristics.
 - .3 The finished surface of any lift shall have a uniform close texture and be free of visible signs of poor workmanship. Any obvious defects as determined by the Consultant such as, but not limited to the following, will be cause for automatic rejection of asphalt concrete pavement regardless of the values of any other control characteristic.
 - .1 Individual bumps and dips 12 mm or greater. The Consultant may reject asphalt concrete pavement with individual bumps and dips exceeding 8 mm and less than 12 mm.
 - .2 Segregated areas not already covered in this Section under Pavement Segregation Requirements, 2.3 subsection 6.

- .3 Areas of excess or insufficient asphalt.
- .4 Improper matching of longitudinal and transverse joints.
- .5 Roller marks.
- .6 Tire marks.
- .7 Cracking or tearing.
- .8 Sampling locations not properly reinstated.
- .9 Improperly constructed patches.
- .10 Top lift surfaces, which are torn due to the dragging of the paver screed.
- .11 Any final lift surface with a variation greater than 6 mm from the edge of a 3 m straightedge placed in any direction on the surface.
- .4 When ACP is rejected by reason of obvious defects, the minimum area of rejection will be Sublot size as defined in this specification.
- .5 Rejected work shall be promptly repaired, remedied, overlaid, or removed and replaced all in a manner acceptable to the Consultant. The Contractor shall be responsible for all costs including materials.
- .6 No payment will be made for work in any Lot or Sublot which has been rejected, until the defects have been remedied.
- .7 If an overlay is used as a corrective measure on a defective Lot or Sublot, the overlay thickness will be subject to the approval of the Consultant. Where an overlay is used as a corrective measure in any lane, adjacent lanes shall also be overlaid to the same thickness and length, regardless of whether the adjacent lanes were acceptable or not. The overlay will be subject to the same specifications as the original pavement, except that the minimum thickness of an overlay shall be the lesser of 40 mm or the design lift thickness of the defective material.

2.6 MEASUREMENT AND PAYMENT

- .1 General
 - .1 The unit prices for the following items of work will be full compensation for all labour, material, tools, equipment and incidentals necessary to complete the Work in accordance with these Specifications.
- .2 Asphalt Concrete Pavement
 - .1 Accepted asphalt concrete pavement will be measured in tonnes and will be paid for at the unit price bid per tonne for "Asphalt Concrete Pavement " for the applicable asphalt Mix Type, subject to the unit price adjustments and assessments hereinafter specified. This payment will be full compensation for

supplying, applying and maintaining tack coat; supplying the asphalt binder; processing, hauling and placing the mix; interim lane marking and quality control.

.2 Payment for Acceptable Work

.1 The following end product properties of "Asphalt Concrete Pavement" will be measured for acceptance.

.1 Density

.2 Actual Asphalt Content

.3 Aggregate Gradation

.2 For the Density, Actual Asphalt Content of a Lot to be acceptable, the Lot Means must be within the acceptance limits shown in Tables 3.50 A and 3.50 B respectively.

.3 For each Lot, the unit price adjustments for Density and Actual Asphalt Content will be the amounts shown in Tables 3.50 A and 3.50 B for the Sample Mean of the test results for that Lot.

.4 For each Lot, the unit price adjustment for Gradation will be as defined in, Aggregate Gradation Requirements in this Section.

.5 The unit price applicable to each Lot quantity of "Asphalt Concrete Pavement" will be calculated as follows:

.1 $\text{Lot Unit Price Per Tonne} = \text{Contract Unit Price Bid Per Tonne} + \text{The Sum of the Unit Price Adjustment for Pad and PAa and PAG}$

.2 Where: PAd = Unit Price Adjustment for Density (bonus or penalty) PAa = Unit Price Adjustment for Asphalt Content (penalty only; QA Acceptance Lots only) PAG = Unit Price Adjustment for Gradation (bonus or penalty; QA Acceptance Lots only)

.6 If the Lot Mean for Density, Actual Asphalt Content or Gradation for any Lot is outside the acceptance limit, the Lot is rejected, and no payment will be made for the quantity of asphalt concrete pavement in that Lot, until the defect has been remedied.

.7 No payment will be made for any material, equipment or manpower used to improve acceptable work that is or was subject to unit price adjustment or penalty assessment.

.3 Segregation Payment Adjustments

.1 Payment adjustments for pavement segregation shall apply to the top lift of ACP only and in accordance with the following:

-
- .1 Segregated areas, centre-of-paver streak and any repaired segregated areas identified by the Consultant either during construction or during the inspection conducted 2 weeks after the completion of paving work, will be used to determine payment adjustments. Payment adjustments will not apply to segregated areas 0.1 m² or less or on centre-of-paver streaks 1 m or less in length.
 - .2 Segregated areas (excluding centre-of-paver streaks) separated by less than 3 m shall be considered a single area for the determination of payment adjustments. For centre-of-paver streak, each area will be measured separately for payment adjustments.
 - .3 Payment adjustments for segregation will not apply to entrances or the portion of an intersection outside the through travel lanes and shoulders.
 - .4 If a segregated area is identified by the Contractor and repaired prior to inspection by the Consultant it will be classified as "moderate" for the purpose of determining payment adjustments.
 - .5 Payment adjustments will apply regardless of the year the pavement is placed and the year the pavement is inspected.
 - .6 Payment adjustments will not apply to instances where the Consultant determines that the paver screed is "dragging".
 - .2 The total payment adjustment for segregation is determined as follows:
 - .1 Each lane.km of the completed pavement is inspected separately by the Consultant. A "lane" includes the adjoining shoulder. Measurement of lane.kms will be made in 1 kilometre (or partial kilometre) long segments, 1 lane wide as shown on the Contract Drawing. Acceleration and deceleration lanes and interchange ramps are considered separate lanes.
 - .3 For each lane.km, the Consultant will determine the following:
 - .1 The total number of slight segregated areas and
 - .2 The total number of moderate and severe segregated areas and
 - .3 The total length of centre-of-paver streak (determined by adding each instance of streak that is in excess of 1 m in length)
 - .4 These values will be used for the "segregation frequencies" and "length of centre-of-paver streak" in Tables A, B & C as applicable, with the exception that for partial lane.kms, the segregation frequency for slight segregation will be calculated by dividing the actual number of slight segregated areas by length of the segment assessed (expressed in kilometres) and rounding to the nearest whole

number.

Table A, Payment Adjustment for Slight Segregation

Segregation Frequency of Slight Areas (per lane-km)	Payment Adjustment (\$ per lane-km)
0	(1)
1 or 2	(2)
Greater than 1	- (number of areas – 2) x \$100

Table B, Payment Adjustment for Moderate and Severe Segregation

Segregation Frequency of Moderate and Severe Areas (per lane-km)	Payment Adjustment (\$ per lane-km)
0	(1)
Greater than 0	- (number of areas) x \$500

Table C, Payment Adjustment for Centre-of-Paver Streak

Length of Centre-of-Paver Streak (per lane-km)	Payment Adjustment (\$ per lane-km)
1 metre or less	(1)
Greater than 1 metre	- \$1.50 per linear metre

- (1) Lane kilometres with no areas of segregation of any type or severity, or any centre-of-paver streaks will be assigned a bonus payment of \$1,000 per lane.km. For partial lane.kms the bonus will be pro-rated based upon the actual length of the segment assessed.
- (2) Lane kilometres with 1 or 2 areas of slight segregation, no moderate or severely segregated areas and no centre-of-paver streak will be assigned a bonus payment of \$500 per lane.km. For partial lane.kms the bonus will be pro-rated based upon the actual length of the segment assessed.

Notes:

- Total payment adjustment per lane·km for segregation will be the sum of Tables A, B and C.
- For partial lane kilometres, the payment adjustments for Table A will be prorated based upon the actual length of segment assessed.
- The maximum penalty adjustment for segregation shall be limited to \$2,000 per lane·km. For partial lane·kms, this adjustment will be prorated based upon the actual length of segment assessed

.5 Payment For Work That Had Been Rejected, But Was Made Acceptable

- .1 When defects have been remedied in Lots or Sublots which had been rejected, payment for the original quantity of material in those Lots or Sublots will be made subject to unit price adjustments and penalty

assessments determined as follows:

- .1 The unit price adjustment for Asphalt Content, Density and Gradation will be based on testing of the replacement or overlay material where applicable. Where replacement or overlay material does not cover the entire Lot or Sublot, prior tests on the uncovered area will be averaged with new tests on the corrective work.
 - .2 The unit price adjustment determined through retesting of the corrective work will be applied to that quantity of material in the Lot or Sublot which was originally rejected, to determine payment.
 - .3 No payment will be made for any material used to replace, repair or overlay rejected work and all corrective work shall be performed entirely at the Contractor's expense.
 - .3 Repair of Failed Areas in Existing Surfaces
 - .1 Repair of failed areas in existing surfaces will be paid for at the Contract unit prices bid for the Work. Unit price adjustment will not apply to material used to repair failed areas in existing surfaces.
 - .4 Removal and Disposal of Fillet and Ramp Material
 - .1 The removal and disposal of fillet and/or ramp material will be considered incidental to the Work and will not be paid for separately.
 - .5 Transverse Pavement Joints
 - .1 Constructing transverse pavement joints including any required cold-milling will be considered incidental to the Work and will not be paid for separately.
 - .6 Preliminary Leveling
 - .1 Accepted material used for preliminary leveling will be measured and paid for at the unit price bid for "Asphalt Concrete Pavement" where applicable. Unit price adjustments will not apply to material used for leveling. No payment will be made for unacceptable material.
 - .7 Asphalt Mix for Others
 - .1 Accepted additional asphalt concrete mixture will be measured in tonnes and paid for at the unit price bid for "Asphalt Mix For Others". Unit price adjustment will not apply to additional asphalt concrete received at the plant by other forces.
 - .8 Grooved Rumble Strips
 - .1 Measurement of shoulder grooving will be made parallel to the road centreline,

to the nearest 0.001 km of through highway chainage for each side of the road where accepted grooving is performed. Payment for shoulder grooving will be made at the unit price bid per kilometre for "Grooved Rumble Strips". This payment will be full compensation for all labour, equipment, tools, materials and incidentals necessary to complete the Work.

Table 3.50 A – Unit Price Adjustment for Density

% of Marshall Density	Unit Price Adjustment – Dollars per Tonne				
	Design Lift Thickness				
Lot Mean	35 mm or Greater	Less than 35 mm and Greater than 20 mm	20 mm	35 mm or Greater	Less than 35 mm and Greater than 20 mm
	Lower Lifts	Lower Lifts	Lower Lifts	Top Lift Only	Top Lift Only
≥98.0	+ 1.00	+ 1.00	+ 1.00	+ 1.00	+ 1.00
97.9	+ 0.90	+ 0.90	+ 0.90	+ 0.90	+ 0.90
97.8	+ 0.80	+ 0.80	+ 0.80	+ 0.80	+ 0.80
97.7	+ 0.70	+ 0.70	+ 0.70	+ 0.70	+ 0.70
97.6	+ 0.60	+ 0.60	+ 0.60	+ 0.60	+ 0.60
97.5	+ 0.50	+ 0.50	+ 0.50	+ 0.50	+ 0.50
97.4	+ 0.40	+ 0.40	+ 0.40	+ 0.40	+ 0.40
97.3	+ 0.30	+ 0.30	+ 0.30	+ 0.30	+ 0.30
97.2	+ 0.20	+ 0.20	+ 0.20	+ 0.20	+ 0.20
97.1	+ 0.10	+ 0.10	+ 0.10	+ 0.10	+ 0.10
97.0	0.00	0.00	0.00	0.00	0.00
96.9	- 0.20	0.00	0.00	- 0.20	0.00
96.8	- 0.40	0.00	0.00	- 0.40	0.00
96.7	- 0.60	0.00	0.00	- 0.60	0.00
96.6	- 0.80	0.00	0.00	- 0.80	0.00
96.5	- 1.00	0.00	0.00	- 1.00	0.00
96.4	- 1.20	0.00	0.00	- 1.20	0.00
96.3	- 1.40	0.00	0.00	- 1.40	0.00
96.2	- 1.60	0.00	0.00	- 1.60	0.00
96.1	- 1.80	0.00	0.00	- 1.80	0.00
96.0	- 2.00	0.00	0.00	- 2.00	0.00
95.9	- 2.20	0.00	0.00	- 2.20	- 0.20
95.8	- 2.40	0.00	0.00	- 2.40	- 0.40
95.7	- 2.60	0.00	0.00	- 2.60	- 0.60
95.6	- 2.80	0.00	0.00	- 2.80	- 0.80
95.5	- 3.00	0.00	0.00	- 3.00	- 1.00
95.4	- 3.20	0.00	0.00	- 3.20	- 1.20
95.3	- 3.40	0.00	0.00	- 3.40	- 1.40
95.2	- 3.60	0.00	0.00	- 3.60	- 1.60
95.1	- 3.80	0.00	0.00	- 3.80	- 1.80
95.0	- 4.00	0.00	0.00	- 4.00	- 2.00
94.9	- 4.40	0.00	0.00	- 4.40	- 2.20
94.8	- 4.80	0.00	0.00	- 4.80	- 2.40
94.7	- 5.20	0.00	0.00	- 5.20	- 2.60
94.6	- 5.60	0.00	0.00	- 5.60	- 2.80
94.5	- 6.00	0.00	0.00	- 6.00	- 3.00
94.4	- 6.40	0.00	0.00	- 6.40	- 3.20
94.3	- 6.80	0.00	0.00	- 6.80	- 3.40

94.2	- 7.20	0.00	0.00	- 7.20	- 3.60
94.1	- 7.60	0.00	0.00	- 7.60	- 3.80
94.0	- 8.00	0.00	0.00	- 8.00	- 4.00
93.9	50% of Unit Price	- 0.20	0.00	Overlay/Rm&Rp	- 4.40
93.8	50% of Unit Price	- 0.40	0.00	Overlay/Rm&Rp	- 4.80
93.7	50% of Unit Price	- 0.60	0.00	Overlay/Rm&Rp	- 5.20
93.6	50% of Unit Price	- 0.80	0.00	Overlay/Rm&Rp	- 5.60
93.5	50% of Unit Price	- 1.00	0.00	Overlay/Rm&Rp	- 6.00
93.4	50% of Unit Price	- 1.20	0.00	Overlay/Rm&Rp	- 6.40
93.3	50% of Unit Price	- 1.40	0.00	Overlay/Rm&Rp	- 6.80
93.2	50% of Unit Price	- 1.60	0.00	Overlay/Rm&Rp	- 7.20
93.1	50% of Unit Price	- 1.80	0.00	Overlay/Rm&Rp	- 7.60
93.0	50% of Unit Price	- 2.00	0.00	Overlay/Rm&Rp	- 8.00
92.9	50% of Unit Price	- 2.20	- 0.20	Overlay/Rm&Rp	- 8.40
92.8	50% of Unit Price	- 2.40	- 0.40	Overlay/Rm&Rp	- 8.80
92.7	50% of Unit Price	- 2.60	- 0.60	Overlay/Rm&Rp	- 9.20
92.6	50% of Unit Price	- 2.80	- 0.80	Overlay/Rm&Rp	- 9.60
92.5	50% of Unit Price	- 3.00	- 1.00	Overlay/Rm&Rp	- 10.00
92.4	50% of Unit Price	- 3.20	- 1.20	Overlay/Rm&Rp	- 10.40
92.3	50% of Unit Price	- 3.40	- 1.40	Overlay/Rm&Rp	- 10.80
92.2	50% of Unit Price	- 3.60	- 1.60	Overlay/Rm&Rp	- 11.20
92.1	50% of Unit Price	- 3.80	- 1.80	Overlay/Rm&Rp	- 11.60
92.0	50% of Unit Price	- 4.00	- 2.00	Overlay/Rm&Rp	- 12.00
91.9	50% of Unit Price	- 4.40	- 2.20	Remove&Replace	- 12.40
91.8	50% of Unit Price	- 4.80	- 2.40	Remove&Replace	- 12.80
91.7	50% of Unit Price	- 5.20	- 2.60	Remove&Replace	- 13.20
91.6	50% of Unit Price	- 5.60	- 2.80	Remove&Replace	- 13.60
91.5	50% of Unit Price	- 6.00	- 3.00	Remove&Replace	- 14.00
91.4	50% of Unit Price	- 6.40	- 3.20	Remove&Replace	- 14.40
91.3	50% of Unit Price	- 6.80	- 3.40	Remove&Replace	- 14.80
91.2	50% of Unit Price	- 7.20	- 3.60	Remove&Replace	- 15.20
91.1	50% of Unit Price	- 7.60	- 3.80	Remove&Replace	- 15.60
91.0	50% of Unit Price	- 8.00	- 4.00	Remove&Replace	- 16.00
90.9	Remove&Replace	50% of Unit Price	- 4.40	Remove&Replace	50% of Unit Price
90.8	Remove&Replace	50% of Unit Price	- 4.80	Remove&Replace	50% of Unit Price
90.7	Remove&Replace	50% of Unit Price	- 5.20	Remove&Replace	50% of Unit Price
90.6	Remove&Replace	50% of Unit Price	- 5.60	Remove&Replace	50% of Unit Price
90.5	Remove&Replace	50% of Unit Price	- 6.00	Remove&Replace	50% of Unit Price
90.4	Remove&Replace	50% of Unit Price	- 6.40	Remove&Replace	50% of Unit Price
90.3	Remove&Replace	50% of Unit Price	- 6.80	Remove&Replace	50% of Unit Price
90.2	Remove&Replace	50% of Unit Price	- 7.20	Remove&Replace	50% of Unit Price
90.1	Remove&Replace	50% of Unit Price	- 7.60	Remove&Replace	50% of Unit Price
90.0	Remove&Replace	50% of Unit Price	- 8.00	Remove&Replace	50% of Unit Price
89.9	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.8	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.7	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.6	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.5	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.4	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.3	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.2	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.1	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
89.0	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp

88.9	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.8	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.7	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.6	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.5	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.4	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.3	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.2	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.1	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
88.0	Remove&Replace	Remove&Replace	50% of Unit Price	Remove&Replace	Overlay/Rm&Rp
≤ 87.9	Remove&Replace	Remove&Replace	Remove&Replace	Remove&Replace	Overlay/Rm&Rp

- Single lifts only are considered “Top Lifts”.
- Preliminary leveling is not considered a “Lift”.

Table 3.50 B – Unit Price Adjustment for Asphalt Content

Deviation of the Actual Asphalt Content from the Approved Asphalt Content	Unit Price Adjustment for Asphalt Content PAa \$ per tonne			
	Top Lift		Lower Lift	
	Below	Above	Below	Above
From 0 to 0.30	0.0	0.0	0.0	0.0
From 0.31 to 0.35	-2.6	-0.9	-2.6	-0.9
From 0.36 to 0.40	-3.8	-1.8	-3.8	-1.8
From 0.41 to 0.45	-5.0	-2.7	-5.0	-2.7
From 0.46 to 0.50	-6.1	-3.6	-6.1	-3.6
From 0.51 to 0.55	-	-	-7.2	-4.5
From 0.56 to 0.60	-	-	-8.4	-5.4
From 0.61 to 0.65	-	-	-9.5	-6.3

- For top lift deviations of more than 0.50% the Contractor shall either overlay or remove and replace the previously placed mix.
- For lower lift deviations of more than 0.65%, Parks Canada will determine whether removal and replacement is necessary. For material that is allowed to stay in place, payment will be at 50% of the unit price bid.

Table 3.50 D – Gradation Tolerances for the Lot Mean from the Job Mix Formula and Maximum Range between Individual Test Results in a Lot

Characteristics	Sieve Size µm					
	20 000, 16 000, 12 500, 10 000, 5 000 (1)	1 250	630	315	160	80
Tolerances for the Lot Mean from the Job Mix Formula	+/-5	+/-3	+/-2	+/-2	+/-1.5	+/-1.5
Maximum Range Between Individual Test Results in a Lot	10	6	5	4	3	3

Table 3.50 E – Maximum Deviation for the Lot Mean from the Gradation Limits Specified in Table 3.2.3.1 of Specification 3.2 Aggregate Production and Stockpiling

Characteristic	Sieve Size μm		
	20 000, 16 000, 12 500, 10 000 (1)	5 000, 1 250, 630, 315	160, 80
Maximum Deviation for the Lot Mean from Specification 3.2 Gradation Limits	2	1	0.5

(1) Include all sieve sizes up to one size smaller than top size.

Table 3.50 F – “A” and “B” Adjustment Points for Deviation in Gradation

Sieve Size μm	MEAN
20 000, 16 000, 12 500, 10 000, 5 000 (1)	5 for each 1% Deviation
1250	1 for each 1% Deviation
630	2 for each 1% Deviation
315	2 for each 1% Deviation
160	0.2 for each 0.1% Deviation
80 Deviation $\leq 1.0\%$ 80 Deviation $> 1.0\%$	1.0 for each 0.1% Deviation 2.0 for each additional 0.1% Deviation

(1) Include all sieve sizes up to one size smaller than top size.

Lot Mean Adjustment points will be calculated for each Lot. If the Lot Mean does not exceed the requirements in Table 3.50 E, a Lot Gradation Price Adjustment per tonne will be applied based on the following formula:

$$\text{PAg} = (A \times -\$0.04) + (B \times -\$0.40) + \text{Bonus}$$

Where:

PAg = Unit Price Adjustment for Gradation (bonus or penalty; QA Acceptance Lots only)

A = Mean Adjustment Points assessed within the gradation limits specified in Specification 3.2 but beyond the Job Mix Formula tolerance requirements in Table 3.50 D.

B = Mean Adjustment Points assessed outside the gradation limits specified in Specification 3.2 regardless of the Job Mix Formula tolerance.

Bonus = +\$0.20 when there are no Mean Adjustment Points and the maximum range as shown in Table 3.50 D, is not exceeded for any sieve size in the Lot.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 CAN/CGSB-1.5-M91, Low Flash Petroleum Spirits Thinner.
- .2 CGSB1-GP-12c-68, Standard Paint Colours.
- .3 CGSB1-GP-71-83, Method, of Testing Paints and Pigments.
- .4 CGSB1-GP-74M-79, Paint, Traffic, Alkyd.

Part 2 Products

2.1 MATERIALS

- .1 Paint:
 - .1 CAN/CGSB-1.5-M91, Low Flash Petroleum Spirits Thinner.
 - .2 CGSB1-GP-12c-68, Standard Paint Colours.
 - .3 CGSB1-GP-71-83, Method, of Testing Paints and Pigments.
- .2 Thinner: to CAN/CGSB-1.5.
- .3 Glass reflective beads: type suitable for application to wet paint surface for light reflectance, in accordance with Alberta Transportation GB-05 Specification for Glass Beads for Pavement Markings.

Part 3 Execution

3.1 EQUIPMENT REQUIREMENTS

- .1 Paint applicator to be an approved pressure type distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated, and to have positive shut-off.

3.2 CONDITION OF SURFACES

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

3.3 TRAFFIC CONTROL AND WORK AREA

- .1 The Contractor shall at all times keep traffic congestion to a minimum. The work shall be undertaken from one lane and all men, materials and equipment shall be contained as much as possible in that lane. The work shall be carried out as quickly as possible to prevent excessive delay and inconvenience to traffic.
- .2 All equipment or combination of equipment used in application, including the grinder,

vacuum machine or sweeper, material applicator and cone truck shall operate within 100 metres at one time.

3.4 APPLICATION

- .1 Pavement markings to be laid out by the Contractor.
- .2 Unless otherwise approved by the Consultant, apply paint only when air temperature is above 10°C, wind speed is less than 60 km/h and no rain is forecast within next 4 h.
- .3 Apply traffic paint evenly at rate of 3m²/L.
- .4 Do not thin paint unless approved by Consultant.
- .5 Symbols and letters to conform to dimensions indicated.
- .6 Paint lines to be of uniform colour and density with sharp edges.
- .7 Thoroughly clean distributor tank before refilling with paint of different colour.

3.5 TOLERANCE

- .1 Paint markings to be within plus or minus 12 mm of dimensions indicated.
- .2 Remove incorrect markings in accordance with Section 02722- Pavement Surface Cleaning and Removal of Pavement Markings.

3.6 PROTECTION OF COMPLETED WORK

- .1 Protect pavement markings until dry.

3.7 WORKMANSHIP

- .1 Faulty markings such as un-straight lines, too much overflow or non-uniform lengths must be re-done within five (5) working days.
- .2 The Contractor shall remedy all defects in the work due to faulty material of workmanship or failure of the work itself for a period of two (2) years from the date of the Completion Certificate.
- .3 The Consultant shall give the Contractor written notice of all defects observed within the maintenance period. The maintenance shall be a continuous operation and shall be carried on until expiration of the maintenance period, unless there is an outstanding order from the Consultant requiring the Contractor to correct some of the maintenance that has not been completed. The maintenance period shall be in effect until such time as the Consultant issues a Final Completion Certificate.

END OF SECTION

Part 1 General

1.1 MATERIAL

- .1 Salvage stockpiled topsoil berms from stripping operations.

1.2 MEASUREMENT PROCEDURES

- .1 Preparation of sub-grade for placing of topsoil will not be measured for payment. This work is incidental to excavation and ditching operations.
- .2 Measure finished placed top soil in surveyed square metres as directed by Parks Canada Representative.

Part 2 Products

2.1 TOPSOIL

- .1 Topsoil for seeded areas, salvage from stockpiled stripping: mixture of particulates, microorganisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Contain no toxic elements or growth inhibiting materials.
 - .2 Finished surface free from:
 - .1 Debris and stones over 50 mm diameter.
 - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .3 Consistence: friable when moist.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to approved Contractor's ESC Plan.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after Parks Canada Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.

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- .3 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.3 FINISHING GRADING

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

3.4 CLEANING

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

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Hydraulic seeding to be paid in square metres of surveyed surface seeded and maintained (or otherwise accepted by Parks Canada Representative at close of contract) with Grass mixture including seed, mulch and fertilizer.
- .2 Areas of blending into existing turf grass will not be measured for payment.
- .3 The seeding warranty period shall be 24 months.

1.2 SUBMISSIONS

- .1 Submit in accordance with Section 01 33 00 Submittal Procedures.
- .2 Submit manufacturer's instructions, printed product literature and data sheets for seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.
- .3 Submit in writing 5 days prior to commencing work:
 - .1 Submit in accordance with Section 01 33 00 Submittal Procedures.
 - .2 Submit manufacturer's instructions, printed product literature and data sheets for seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.
 - .3 Submit in writing 5 days prior to commencing work:
- .4 Submit 0.5kg container of each type of fertilizer used.
- .5 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.2 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Store seeds and fertilizer in a dry location and in accordance with manufacturer's recommendations. Bags of fertilizer must be labelled identifying mass in kg, mix components and percentages, date of bagging, supplier's name, and lot number.
- .3 Replace defective or damaged materials with new.

Part 2 Product

2.1 DELIVERY, STORAGE AND HANDLING

- .1 Seed shall be Certified Canada No. 1 Grade quality seed varieties, in accordance with the Canadian Seeds Act and Regulations, and having a minimum purity of 97% and germination of 75%. Seed shall be free of impurities and disease.

- .2 Seed mix to be an accepted combination of three seed types listed, by weight:

Slender Wheatgrass	<i>Elymus trachycaulus</i>
Junegrass	<i>Koeleria macrantha</i>
Blue Gramma	<i>Bouteloua gracilis</i>
Sand grass	<i>Calamovilfa longifolia</i>
Western Wheatgrass	<i>Agropyron smithii</i>
Tufted hairgrass	<i>Deschampsia caespitosa</i>
Alpine Bluegrass	<i>Poa alpina</i>
Arctic Bluegrass	<i>Poa arctica</i>
Northern Bentgrass	<i>Agrostis mertensii</i>
Spike Trisetum	<i>Trisetum spicatum</i>
Timber Oatgrass	<i>Danthonia intermedia</i>
Hairy Wildrye	<i>Elymus innovatus</i>
Richardson's Needlegrass	<i>Stipa richardsonii</i>

- .3 Seed mix and Seed Certificate to be approved by Parks Canada Representative.
- .4 Seed mix shall be free of Scentless Chamomile, Downy Brome and Canada Thistle
- .5 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
- .1 Made from wood cellulose fibre.
- .2 Organic matter content: 95% plus or minus 0.5%.
- .3 Value of pH: 6.0.
- .4 S Potential water absorption: 900%.
- .6 Tackifier: [water dilutable, liquid dispersion] [water soluble vegetable carbohydrate powder].
- .7 Water: free of impurities that would inhibit germination and growth.
- .8 Inoculants: inoculant containers to be tagged with expiry date.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for hydraulic seeding in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Parks Canada Representative.
- .2 Inform Parks Canada Representative of unacceptable conditions immediately upon discovery.

3.2 APPLICATION

- .1 Seeding rate to be 100 kg/ha for hydraulic seeding.

3.3 CLEANING

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

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measure supply and installation of pipe culverts including liners, excavation, and non-granular backfill, in metres installed place for each size, type and class of pipe.
 - .1 No separate measurement will be made for couplings and fittings for steel pipe and plastic pipe culvert liners.
 - .2 Culvert cleaning shall be in metres of culvert cleared and cleaned
 - .3 Hand laid riprap shall be paid in cubic metres installed and accepted
 - .4 All measurements by tape or survey measurements.
 - .5 Grouting of liners is incidental
- .2 Any necessary dewatering shall be considered incidental, including dewatering required prior to placing of bedding.

1.2 REFERENCE

- .1 Alberta Transportation – Standard Specifications for Highway Construction (Edition 15)
 - .1 2.18 Concrete and/or Corrugated Steel Storm Sewer
 - .2 2.22 Plastic Culvert Extensions and Culvert Liners
 - .3 5.23 Supply of Corrugated Metal Pipe and Pipe Arches
 - .4 5.24 Supply of Polyethylene Pipe
- .2 ASTM International:
 - .1 ASTM D 1248-05, Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
 - .2 ASTM F 667-06, Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings.
- .3 CSA International:
 - .1 CSA A3000-08, Cementitious Materials Compendium.
 - .2 CSA A257 Series-09, Standards for Concrete Pipe and Manhole Sections.
 - .3 CAN/CSA G401-07, Corrugated Steel Pipe Products.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for pipes and liners and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Certification: to be marked on pipe.
- .4 Test and Evaluation Reports:
 - .1 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

Part 2 Products

2.1 CORRUGATED STEEL PIPE

- .1 Corrugated steel pipe: to CAN/CSA-G401 or as per Alberta Transportation Specification 5.23. 2mm thickness, epoxy coated.

2.2 POLYETHYLENE PIPE LINER

- .1 To ASTM F 667, to be installed within competent existing corrugated steel pipe with smooth walls intended to prevent or minimize icing. "Weholite", "Boss 2000", or equivalent as accepted by Parks Canada Representative. Product to include UV protection at exposed ends.

2.3 GRANULAR BEDDING AND BACKFILL

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

2.4 GROUT

- .1 The Contractor shall supply grout suitable for low pressure pumping into the void between the plastic pipe used as a liner and the surrounding existing culvert and which has a minimum compressive strength of 500 kPa at 28 days. Grout shall be sulphate resistant.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for pipe culvert installation in accordance with manufacturer's written instructions.
 - .1 Inform Parks Canada Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to Contractor's ESC Plan
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 BEDDING

- .1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.
- .2 Place 200 mm minimum thickness of approved granular material on bottom of excavation and compact to 95% minimum of maximum density to ASTM D 698.
- .3 Shape bedding to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Parks Canada Representative, free from sags or high points.
- .4 Place bedding in unfrozen condition.

3.4 LAYING CORRUGATED STEEL PIPE CULVERTS

- .1 Begin pipe placing at downstream end.
- .2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.

- .3 Lay pipe with outside circumferential laps facing upstream.
- .4 Lay paved invert or partially lined pipe with longitudinal centre line of paved segment coinciding with flow line.
- .5 Do not allow water to flow through pipes during construction except as permitted by Parks Canada Representative

3.5 INSTALLING CORRUGATED STEEL PIPE CULVERTS

- .1 Corrugated steel pipe:
 - .1 Match corrugations or indentations of coupler with pipe sections before tightening.
 - .2 Tap couplers firmly as they are being tightened, to take up slack and ensure snug fit.
 - .3 Insert and tighten bolts.
 - .4 Repair spots where damage has occurred to spelter coating by applying two coats of zinc rich epoxy paint.

3.6 INSTALLING PLASTIC PIPE LINER

- .1 Preparation:
 - .1 Prepare the designated existing culverts for installation of the culvert liners by flushing and scouring the existing culverts with water under pressure, and by inspecting and
- .2 Installation:
 - .1 Excavate or clear a trench for assembly of liner pipes at the upstream end of the existing culvert. Push or pull the plastic pipe through the existing culvert while working down grade, preventing any damage to the liner and connecting sections thereafter securely joined together. Pipes shall be joined together to form as flexible and watertight seal. Joints shall not be deflected beyond the manufacture's recommendations.
 - .2 Ensure the liner remains at the existing culvert invert elevation during grouting
- .3 Grouting:
 - .1 Place grout using a low pressure pump to fill the voice completely, with due care that excessive pressure does not damage the liner.

3.7 BACKFILLING

- .1 Backfill around and over culverts as indicated or as directed by Parks Canada Representative.

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- .2 Place granular backfill material in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
 - .3 Compact each layer to 95% maximum density to ASTM D 698 taking special care to obtain required density under haunches.
 - .4 Protect installed culvert with minimum 600 mm cover of compacted fill before heavy equipment is permitted to cross.
 - .1 During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 1:2.
 - .5 Place backfill in unfrozen condition.

3.2 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 – Submittals
- .2 Section 01 74 11 – Cleaning

1.2 REFERENCES

- .1 Alberta Transportation - Standard Specification for Highway Construction, Specification 5.28 Supply Flexible Guide Post Traffic.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for delineators and include product characteristics, performance criteria, physical size, finish and limitations.

Part 2 General

2.1 REFLECTIVE DELINEATORS

- .1 Delineators to meet Alberta Transportation - Standard Specification for Highway Construction, Specification 5.28 Supply Flexible Guide Post Traffic specifications.

Part 3 Execution

3.1 INSTALLATION

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

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement of the supply and install of steel strong post W-beam guard rail including posts, blocks, and necessary hardware shall be in in metres of guard rail installed and measured from outer tips of steel W-beam guide rail, including guide rail used in anchorages and terminal sections. Crashworthy end treatments shall be measured by installed units.

1.2 REFERENCES

- .1 Alberta Transportation – Roadside Design Guide, Appendix B
- .2 Alberta Transportation – Standard Specifications for Highway Construction (Edition 15)
- .3 NCHRP 350 TL-3 Rated – FHWA approved Barriers and Attenuators

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for rail and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect guide rails from damage including nicks, scratches, and blemishes.

Part 2 Products

2.1 MATERIALS

- .1 Supply as per Alberta Transportation Specification 5.25, Supply of W-Beam Guardrail and Posts

- .2 Crash Attenuators shall be SKT 350 Sequential Kinking Terminal or equivalent, as accepted by Parks Canada Representative.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Set posts by instrument for alignment, and locations as indicated and as directed by Parks Canada Representative
- .2 Excavate post holes to depths as indicated in manufacturer's specifications and to diameter of 360 mm plus or minus 20 mm.
 - .1 Compact bottom to provide firm foundation.
 - .2 Set post plumb and square in hole.
- .3 Backfill around posts using excavated material and compact in uniform layers not exceeding 150 mm compacted thickness.
- .4 Leave or make depression approximately 150 mm deep around posts until painting is completed, then fill and compact to ground elevation.
- .5 Cut off tops of posts as indicated, with tops parallel to grade of pavement edge.
- .6 Treat cut tops with 2 coats of approved preservative.
- .7 Erect steel W-beam components to details as indicated. Lap joints in direction of traffic.
 - .1 Tighten nuts to 100 N.m torque or as per manufacturer's specifications.
 - .2 Maximum protrusion of bolt 12 mm beyond nut.

3.3 TOUCH UP

- .1 Galvanized steel-touch up:
 - .1 Clean damaged surfaces with wire brush removing loose and cracked coatings.

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- .2 Apply 2 coats of organic zinc-rich paint to damaged areas.
 - .3 Pre-treat damaged surfaces in accordance with manufacturer's written recommendations for zinc-rich paint.
 - .2 Pre-treat damaged surfaces in accordance with manufacturer's written recommendations for zinc-rich paint.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Leave Work area clean at end of each day.
- .3 Protect installed products and components from damage during construction
- .4 Repair damage to adjacent materials caused by guide rail installation.

END OF SECTION

APPENDIX A

**JASPER NATIONAL PARK – BEST MANAGEMENT PRACTICES
(BMPS)**

END OF SECTION

APPENDIX B

**JASPER NATIONAL PARK – RECREATIONAL VEHICLE (RV) WORK
CAMP – SLEEPY HOLLOW ROAD**

END OF SECTION