

CONTRACT SPECIFICATIONS
FOR
PARKS CANADA
WATERTON TOWNSITE TRAIL UPGRADES
PROJECT NUMBER R.099828.001
FEBRUARY, 2019

<p>ASSOCIATED ENGINEERING</p> <p>QUALITY MANAGEMENT SIGN-OFF</p> <p>Signature: _____</p> <p>Date: _____</p>
<p>APEGA Permit to Practice P 3979</p>

Prepared by Associated Engineering Alberta Ltd.

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Part 1 General

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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 PRECEDENCE

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises general construction of trail improvements and enhancements located at Waterton Lakes National Park; and further identified as WLNP Trails Improvement.
- .2 WLNP General Project Management Practices – Mitigation Package
- .3 Work for this unit price Contract comprises general construction activities of the Bears Hump Trail Improvements and Cameron Falls Area Improvements, including portions of Alderson-Carthew Trail as described in issued for tender drawings and specifications, including but not limited to the following items:
 - .1 General Requirements: General Mobilization Requirements
 - .2 General Requirements: Traffic Management Plan, Accommodation and Signage.
 - .3 General Requirements: Erosion Control and Sediment Control.
 - .4 Bears Hump Trail Improvements
 - .1 Demolition and Removal of the existing trees, wood timbers and the associated metal rebar rods from within the entire length of trail route.
 - .2 Scarify and compact the existing sub-grade materials in preparation for new trail base gravels.
 - .3 Supply and Installation of all required new Trail Base Gravel to lines, grades and typical cross sections as required for the Construction of the Bears Hump Trail Improvements.
 - .4 Supply and Installation of all required new Trail Surfacing Gravel to lines, grades, and cross sections, as required for the Construction of the Bears Hump Trail Improvements.
 - .5 Supply and Installation of all new stone, mortar, and related construction materials as required to fully construct improvements to the Switchback Areas located along the Bears Hump Trail Route to the plans as shown.
 - .6 Supply and Installation of new Stone Waterbar for drainage purposes to be situated at specific points along the Bears Hump Trail route.
 - .7 Supply and Installation of new Wood Waterbars to facilitate drainage and to access across the existing bedrock areas close to the summit of the Bears Hump Trail area.
 - .8 Supply and Installation of new cut Stone Steps as required for ease of access along the Bears Hump Trail Route, to be situated at points along the entire trail as shown on the plans.

- .9 Supply and Installation of new Wood Timber Steps required for ease of access along the exposed bedrock areas of the trail route near the crest of the Bears Hump Trail Route.
- .10 Supply and Installation of new wood Bench units to match the design of the existing on-site style of bench and fabrication.
- .11 Supply and Installation of new Timber Fence to replace sections of the existing post and rail fence damaged by fire.
- .12 Supply and installation of new handrail sections along the improved switchback sections along the Bears Hump Trail Route.
- .13 Supply and install all required material, labour and equipment as required to construct a minor run off water drainage route, off trail from the Bears Hump Trail Route.
- .14 The contractor shall provide heating, hoarding, ground thawing as required by the work.
- .15 Contractor shall provide all required labour and associated equipment for the complete provisions of supplying any required site materials and all equipment as required for the completion of the project. The Contractor may want to utilize the services of a Helicopter Service company for the supply and installation of any materials as required for the overall sitework construction for the overall project. This is up to the discretion of the Contractor and no special payment will be provided. The costs for helicopter, or other methods of supply and installation of the work required, is to be included as incidental to each tender bid item identified.
- .5 Cameron Falls Area Improvements
 - .1 Supply and Installation of the new Cameron Falls Viewing Area Viewpoint Railings.
 - .2 Supply and Installation of site grading improvements to repair the existing shortcut area between Viewpoint One and One-A, including replacement of existing bench.
 - .3 Supply and Installation of a new Removable Safety Handrail Fence on the north side of the Cameron Creek area, at the start of the Cameron Falls Trail.
 - .4 Supply and Installation of a new two meter High Metal Safety Fence line as a Replacement for the existing chain link fence line along the cliff side of the Cameron Falls Trail on the north side of Cameron Falls Viewing Area 1A and Viewpoint Three.
 - .5 Supply and Installation of a new Wood Trail Fence line as a Replacement for the existing chain link fence line along the Cameron Falls Trail on the north side area of the Cameron Falls Viewing Area.
 - .6 Supply and Installation of new Asphalt Areas at the Cameron Falls Viewing Areas to tie to the Alderson Carthew Trailhead.
 - .7 Supply and Installation of new Asphalt Structure along the existing Cameron Falls Trail route on the north side of Cameron Falls Viewing Area including the existing Viewpoint Areas.

- .8 Supply and Installation of Pedestrian Bridge Guardrails safety improvements onto the existing Cameron Falls Pedestrian Bridge Railings on both sides of the Pedestrian Bridge.
- .9 Supply and Installation of a new Metal Handrail Fence as a Replacement for the existing chain link fence line along the Alderson Trail route starting at the Lower Cameron Falls Viewing Area and traversing along the existing Alderson Trail to within 30 meters prior to the new Cameron Falls Overlook Viewpoint Area.
- .10 Supply and Installation of a new Metal Safety Fence as a Replacement for the existing chain link fence line along the cliff side of the existing Alderson Trail extending from the end of the new Alderson Trail Handrail Fence, past the new Overlook to a total length of 250m.
- .11 Supply and Install a New Replacement of the Alderson Trail Overlook Deck along the Alderson Trail route. Work includes all site demolition, disposal of materials and the complete supply and installation of the materials to re-build the fire damaged Alderson Trail Overlook Deck.
- .12 Supply and Installation of all required new Stone Waterbars and Stone Steps as required for the Re-Construction of the Alderson Trail Improvement's. Work is mainly along the Alderson Trail route starting at the Cameron Falls Viewing Area and extending along to the existing Timber Switchback area along the Alderson Trail route.
- .13 Supply and Installation of all required new Alderson Trail Base Gravel and Surface Gravel Improvements, as required for the Re-Construction of the Alderson Trail Area Improvements to just past the Rock Switchback.
- .14 Supply and Installation of all new construction materials as required to fully construct the new improvements to the Cobble Rock Switchback Areas located along the Cameron Falls Trail and Alderson Trail Route to the plans as shown.
- .15 Supply and Installation of new Trail Surfacing Gravel Surface onto the existing Alderson Trail route after the Rock Switchback area to a distance of 250 lineal meters past the new Alderson Trail Overlook Deck location.
- .16 Contractor shall provide all required labour and associated equipment for the complete provisions of supplying any required site materials and all equipment as required for the completion of the project. The Contractor may want to utilize the services of a Helicopter Service company for the supply and installation of any materials as required for the overall sitework construction for the overall project. This is up to the discretion of the Contractor and no special payment will be provided. The costs for helicopter or other method of supply and installation of the work required, is to be incidental to each tender bid item identified.

1.3 CONTRACT METHOD

- .1 Construct Work under unit price contract.

1.4 WORK BY OTHERS

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.
- .2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, any defects which may interfere with proper execution of Work.

1.5 WORK SEQUENCE

- .1 Contractor shall prepare a Project Schedule on the template provided showing proposed schedule of major works within seven (7) days from Award of Contract in accordance with Section 01 32 16 - Construction Progress Schedule.
- .2 Construct Work in stages to accommodate Owner's intermittent use of premises during construction.
- .3 Co-ordinate Progress Schedule
- .4 Required Phases (2):
 - .1 Bears Hump Trail Improvements
 - .1 Construction Start-Up: _____
 - .2 Completion of stone step mock-ups: _____
 - .3 Delivery of stone materials to site: _____
 - .4 Construction 50% Complete: _____
 - .5 Installation Completion: _____
 - .6 Final Completion: _____
 - .2 Cameron Falls Area Improvements
 - .1 Construction Start-Up: _____
 - .2 Completion of fence mock-ups: _____
 - .3 Delivery of fencing materials to site: _____
 - .4 Construction 50% Complete: _____
 - .5 Installation Completion: _____
 - .6 Final Completion: _____
- .5 Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one phase of Work will provide alternate phase.
- .6 Maintain fire access/control.

1.6 SUPERVISORY PERSONNEL

- .1 Within five Days after award notification, the Contractor shall submit to the Departmental Representative confirmation of the names of the supervisory personnel and other key staff designated for assignment on the Contract.
- .2 The following personnel shall be included in the list:
 - .1 Project Superintendent;

- .2 Safety Representative.
- .3 The above personnel shall perform the following duties:
 - .1 The Project Superintendent shall be employed full time and shall be present on the Work Site each and every work day that Work is being performed, from the commencement of Work to Total Performance of the Work;
 - .2 Project Superintendent shall nominate a Deputy Project Superintendent who shall have the authority of the Project Superintendent during the latter's absence;
 - .3 Safety Representative shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement of Work until Total Performance of the Work.

1.7 CONTRACTOR USE OF PREMISES

- .1 Bears Hump Trail Improvements
 - .1 The Bears Hump Trail Parking Lot area will be closed to the public during the entire length of the Contract work. The Contractor will have access and control of the parking lot area for all construction operations and the storage of materials and equipment.
 - .2 The Contractor and the Departmental Representative and the designated Waterton Lakes National Parks designated officer will review and identify additional site locations IF required for the safe and efficient work operations for the use of a Helicopter while within the National Park Boundaries.
- .2 Cameron Falls Area Improvements
 - .1 The Cameron Falls Area Parking Lot area will be closed to the public during the entire length of the Contract work. The Contractor will have access and control of the parking lot area for all construction operations and the storage of materials and equipment.
 - .2 The Contractor and the Departmental Representative and the designated Waterton Lakes National Parks designated officer will review and identify additional site locations IF required for the safe and efficient work operations for the use of a Helicopter while within the National Park Boundaries
- .3 Limit use of premises for Work, for access, for storage, to allow:
 - .1 Partial owner occupancy.
 - .2 Work by other contractors.
- .4 Co-ordinate use of premises under direction of Departmental Representative.
- .5 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .6 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .7 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.

- .8 At completion of operations condition of existing work: equal to or better than that which existed before new work started.
- .9 For the purpose of this contract, Contractor will not be permitted to set up camp in Waterton Lakes National Park.
- .10 Parks Canada regulations prohibit anyone working with the Park from using campground facilities.

1.8 OWNER OCCUPANCY

- .1 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.9 EXISTING SERVICES

- .1 Notify, Department Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Department Representative 48 hours notice for necessary interruption of service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.
- .3 Provide alternative routes for pedestrian and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Department Representative of findings.
- .5 Where unknown services are encountered, immediately advise Department Representative and confirm findings in writing.
- .6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .7 Record locations of maintained, re-routed and abandoned service lines.
- .8 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.10 NATIONAL PARK REGULATIONS

- .1 Contractor and all sub-contractors shall ensure that all work is performed in accordance with ordinances, laws, rules and regulations set out in the National Park Act.
- .2 Contractor and all sub-contractors shall obtain business licenses from Parks Canada Administration Office prior to commencement of work.
- .3 Contractor and all sub-contractors shall comply with all laws and government regulations applicable to work under this contract.
- .4 All Contractor's and all sub-contractor's business and private vehicles are required to obtain vehicle passes from Parks Canada Administration Office.
- .5 Contractor to equip all service vehicles and supervisory vehicles with Emergency Spill Kit DOT-E-10102 or equivalent.

- .6 Contractor is responsible to ensure all sub-contractors comply with the National Park regulations.

1.11 DOCUMENTS REQUIRED

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

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 ACCESS AND EGRESS

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

1.2 USE OF SITE AND FACILITIES

- .1 The Work Site will be specified by the Departmental Representative and shall only be used for the purposes of the Work. The Work Site will be made available to the Contractor for its exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.
- .2 Office trailer, if needed, may be set up at a location specified by potential areas labelled on the drawings and confirmed with the Departmental Representative.
- .3 While the Work Site is under the Contractor's control, the Contractor shall be entirely responsible for the security of the Work Site and of the Work.
- .4 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of the source. Snow/ice shall be removed by the Contractor as necessary for the performance and inspection of the Work.
- .5 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.
- .6 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at its expense.
- .7 The Contractor may work 24 hours per day, seven days per week with the following restrictions:
 - .1 No construction will be allowed during the long weekends.
- .8 No hauling of material during inclement weather.
- .9 Execute work with least possible interference or disturbance to normal use of premises.
- .10 Make arrangements with Departmental Representative to facilitate work as stated.
- .11 Where security is reduced by work, provide temporary means to maintain security. Closures: protect work temporarily until permanent enclosures are completed.

1.3 HELICOPTER TRANSPORTATION & USE

- .1 The following information shall be used to determine helicopter use.
 - .1 Rigging materials: Slings, straps and nets, to be provided by Contractor.
 - .2 Weather Constraints: High winds and low visibility due to rain, fog, or smoke.
 - .3 Expected Helicopter Daily Availability: Begin at first light and finish an hour prior to dark. (8:00 – 20:00)

- .4 Safety briefing will be required before each operation.
- .5 Radios are required for communication with Helicopter crew.
- .6 Rigging Procedures: Long poles can be slung from one end with a cable. Platforms can be slung from all four corners. Tools can be slung in nets.
- .7 All lifts are to be long line to reduce rotor wash impacts.

1.4 EXISTING SERVICES

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

1.5 USE OF PUBLIC AREAS

- .1 The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle.
- .2 All vehicles arriving at or leaving the Work Site and transporting materials shall be loaded in a manner which will prevent dropping of materials or debris on the roadways, and, where contents may otherwise be blown off during transit, such loads shall be covered by tarpaulins or other suitable covers.
- .3 Spills of material, including rocks and debris from loaded trucks, shall be removed or cleaned immediately by the Contractor at no cost to the Owner.
- .4 Hauling units on public highways shall not to exceed legal highway load limits and speed limits. The Contractor is responsible for ensuring all equipment accessing the Highway meets all requirements for vehicles traveling on Public Highways in the Province.
- .5 All activities shall be in accordance with Section 01 35 43 Environmental Procedures and the Environmental Protection Plan prepared by the contractor for the project.

1.6 WORK CONDUCTED IN AND ADJACENT TO WATERWAYS

- .1 All components of the Work shall be in accordance with Section 01 35 43 Environmental Procedures.
- .2 The Project Site location is adjacent to the Waterton Park Townsite area and at the west side of the Town. The site parking lot area is small and the area is beside a roadway used by the public. The work shall not endanger the public uses within the areas.
- .3 The Contractor must have acceptable and approved methods of spill kits, and a Safety Plan completed for the works.

- .4 The work is subject to approval by the Parks Canada environmental surveillance officer. In addition, this storage area will be within the existing parking lot area footprint and will not occur on adjacent vegetation.
- .5 The Contractor is responsible for the development and supply of construction access to the Work as approved by the Departmental Representative.

1.7 SPECIAL REQUIREMENTS

- .1 Only minimal transportation of equipment and material by motorized vehicle (quad or similar) on the Bears Hump Trail will be permitted. The Contractor has to review and determine the best method of site delivery from the parking lot staging area for the most efficient and effective means of getting supplies, equipment, and staff to the specific job site location.
- .2 Only minimal transportation of equipment and material by motorized vehicle (quad or similar) at the Cameron Falls Trail and the Alderson Trail areas. The Contractor has to review and determine the best method of site delivery from the parking lot staging area for the most efficient and effective means of getting supplies, equipment, and staff to the specific job site location. The Contractor and Departmental Representative shall review together at the initial start up meeting the best method of site delivery of all materials and equipment for the duration of the contract work.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.
- .5 Ingress and egress of Contractor vehicles at site is limited to parking lot and entrance or exit areas adjacent to the site, or areas as designated by the Departmental Representative.
- .6 Deliver materials outside of peak traffic hours.

1.8 SMOKING ENVIRONMENT

- .1 Comply with applicable smoking restrictions.

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 MEASUREMENT AND PAYMENT

- .1 Payments will be made on the basis of the lump sum prices bid and the unit prices bid in the Tender, and in accordance with the Terms and Conditions of the Contract.
- .2 the prices bid for various items of work, unless specifically noted otherwise, shall include the supply of all labor, material, plant, equipment, profit and overhead necessary to construct the work in accordance with the drawings and specifications.
- .3 The prices bid for supply of materials and installation of materials shall be full compensation of supplying, hauling, installing, cleaning, testing, and placing in service together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.
- .4 The method of measurement of the quantities for payment and the basis for payment will be in accordance with the following items of this section. All measurement will be done by the Contractor using generally accepted field survey methods and will be verified by the Departmental Representative.
- .5 Where the tender shows separate items for supply and installation, the unit prices or lump sum prices bid for supply shall include supplying, delivering, loading, unloading and all allowances for handling, storage, breakage and waste. Payment will be made only for materials actually installed.
- .6 All materials on site whether existing structures, vegetation, topsoil, gravel, sand or other excavated, or piled materials are the property of the Owner or the owner of the land on which the work is located. Only those materials specifically noted in the specification or on drawings as belonging to the Contractor shall become the Contractor's property.
- .7 Where there are excess excavated materials, unsuitable materials excavated or materials of any kind that are excavated but not used in the work, such materials are not the property of the Contractor unless authorized in writing by the Departmental Representative or specified to be disposed of by the Contractor.
- .8 Each unit price shall be the full and only amount payable for the unit and all things directly or indirectly required to complete it in accordance with the contract, such as, but not limited to delivering, erecting, handling, re-handling, storing, consumable items, temporary facilities, scaffolding, protecting, painting, dewatering, setting out, disposing, dust control, clean up, measuring, calculating, scheduling, administration, supervising, inspection, testing, overhead and profit.
- .9 Each item will be measured for payment in the unit stated in the Schedule of Prices. The unit prices in the Schedule shall remain unchanged notwithstanding differences between the actual quantities and quantities shown herein.
- .10 The items listed in the Schedule of Prices shall, when all considered together, cover the entire Scope of the Work required by the Tender Documents at the time of tendering. The scope of each item is, and shall be, interpreted accordingly.
- .11 Provisional items as identified in the Schedule of Prices are discretionary and will be determined by the Owner if they are to be constructed as part of the work following the award of this Contract.

Part 2 MEASUREMENT AND PAYMENT ITEMS

2.1 GENERAL

- .1 General Requirements
 - .1 This Lump Sum Price will include all costs associated in mobilizing, maintaining and demobilizing the site, required to execute the work including:
 - .1 Specified insurance, equipment, operating overhead, mobilization and demobilization costs required to maintain the workforce on site.
 - .2 Temporary material storage and handling.
 - .3 Maintenance of stockpile and material conditioning sites including restoration.
 - .4 Notification of Alberta First Call and other private sources necessary to obtain all underground utility locations.
 - .5 Location of existing utilities by Hydrovac-ing or other approved means.
 - .6 Assume role and responsibility of Prime Contractor under the Occupational Health and Safety Act.
 - .7 Provision and implementation of Environmental Protection Plan (excluding preparation of an erosion and sediment control plan) in accordance with Section 01 35 43 - Environmental Procedures.
 - .8 Construction Survey requirements including all labour, materials and coordination required to complete any required Construction Surveys
 - .9 Materials testing and quality control as specified in Section 01 45 00 - Quality Control not noted elsewhere in this Section.
 - .10 Supply, maintenance and utility costs for Contractor's Field Offices as specified in Section 01 52 00 - Construction Facilities.
 - .11 Any work listed in Specification Sections that is not noted elsewhere as a separate payment but is considered incidental.
 - .2 Measurement for this lump sum item will be based on a percentage of work completed in dollars.
 - .3 Payment will be made at the lump sum price bid.
- .2 Traffic Management Plan, Accommodation and Signage
 - .1 This lump sum item is to include all costs associated with the provision and implementation of temporary access roadways, temporary paths, temporary barriers, delineators, barricades, flashing lights, signage, flagmen and all other traffic controls and measures required to protect the public from the worksite and to provide access at intersecting private driveways, streets, including maintenance of such items. Traffic regulation shall be in accordance with the TAC Manual of Uniform Traffic Control Devices. This lump sum item is to also include full compensation for the labour, material and equipment necessary to ensure continuous access to the businesses affected by construction.
 - .2 Measurement for this lump sum item will be based on a percentage of work completed in dollars.
 - .3 Payment will be made at the lump sum price bid.
- .3 Erosion and Sediment Control

- .1 This lump sum item is to include all costs in providing care and control of water including furnishing, installing and maintaining all pumps, hoses, power sources and related equipment required for dewatering the various parts of the work and for maintaining excavations and foundations and other parts of the work free of water, ice and snow from whatever source. This lump sum also includes all costs in providing all erosion control requirements of any regulatory agency. The erosion and sediment control measures shall include preparation of an erosion and sediment control plan (prior to construction), supply, and installation of erosion control measures as well as maintenance of the erosion and sediment control measures throughout construction and to issuing of the final acquisition certificate (FAC). This lump sum item also includes protection of adjacent areas outside of the limits of construction from water or run-off, originating within the limits of construction. Payment shall also include removal and disposal of the erosion and sediment control measures at the time of FAC.
- .2 Measurement for this lump sum item will be based on a percentage of work completed in dollars.
- .3 Payment will be made at the lump sum price bid.

2.2 TRAIL WORK – BEARS HUMP

- .1 Subgrade Preparation
 - .1 The unit price bid for “Subgrade Preparation” shall be considered full compensation for all materials, labour and equipment required for preparing the trail surface for gravel subgrade, including excavating where required, scarifying, placing, blading, mixing, shaping, grading, moisture conditioning, compacting, maintaining, proof rolling, associated clean up and all work incidental to complete the work. Any materials excavated that are not required for subgrade fill on this project shall be managed on site at the discretion of the Departmental Representative.
 - .2 Each area of approved prepared subgrade will be measured by length and average width to produce an area in square metres.
 - .3 Payment will be made for each square metre of approved prepared subgrade surface.
- .2 Gravel Base
 - .1 The unit price for the installation the of the “Gravel Base” shall be full compensation for all labour, supply, site delivery, handling of imported gravel materials at the staging areas, the supply of the base gravel fills from the staging areas to the exact job site locations, mixing of the Portland cement with the gravel fills at the staging area, placement of gravel fills, compaction, and including all work and incidental items for which separate payment is not elsewhere provided.

The price bid shall also include all costs associated with the provision and requirements of the use of a helicopter service to supply the base gravel from the staging area to the exact job site location. Contractor is responsible for engaging and providing all necessary safety requirements for the provisions of a helicopter service.

- .2 Measurement will be based on tonnes of gravel base supplied, delivered and completely installed in the finished work as measured by the Owner.
Measurement will be based on truck delivery slips provided daily.

No additional payment will be made for supply, and mixing of Portland cement in gravel base, and is considered incidental to the unit price bid.
- .3 Payment will be based on the full unit price per tonne of gravel base.
- .3 Surface Gravel
 - .1 The unit price for the installation the of the “Surface Gravel” shall be full compensation for all labour, supply, site delivery, handling of imported gravel materials at the staging areas, the supply of the surface gravel fills from the staging areas to the exact job site locations, mixing of the Portland cement with the gravel fills at the staging area, placement of gravel fills, compaction, and including all work and incidental items for which separate payment is not elsewhere provided.

The price bid shall also include all costs associated with the provision and requirements of the use of a helicopter service to supply the surface gravel from the staging area to the exact job site location. Contractor is responsible for engaging and providing all necessary safety requirements for the provisions of a helicopter service.
 - .2 Measurement will be based on tonnes of gravel surface supplied, delivered and completely installed in the finished work as measured by the Owner.
Measurement will be based on truck delivery slips provided daily.
 - .3 Payment will be based on the full unit price per tonne of surface gravel.
- .4 Stone Steps
 - .1 The unit price for the completed installation of the “Stone Steps” shall be full compensation for all labour, supply, site delivery, of all stone steps as required to fully construct a new Stone Step unit, supply and delivery of any other foundation material as required for the installation of the stone steps and the complete excavation, compaction, leveling and grading operations as required to fully install a new stone step unit. Removal of all existing wood waterbar units and associated metal rebars fittings, the hauling and site disposal of the wood materials to a landfill located outside the Park Boundaries is incidental to the work.

The price bid shall also include all costs associated with the provision and requirements of the use of a helicopter service to supply Rock and Gravel materials from the staging area to the exact job site location. Contractor is responsible for engaging and providing all necessary safety requirements for the provisions of a helicopter service to provide all the new Stone Steps to the specific job site.
 - .2 Measurement will be taken based on the total number of new Stone Steps; completely installed to an acceptable finish grade; the rough and finish work as necessary to fully complete the Stone Step.
 - .3 Partial payment will be made for the FOB to site. Remaining payment will be made per each 600mm length of Stone Step fully installed.
- .5 Wood Timber Steps

- .1 The unit price for the completed installation of the “Wood Timber Steps” shall be full compensation for all labour, supply, site delivery, of all imported wood materials as required to fully construct a new Wood Timber Step unit, the supply and delivery of edge rail material as required for the installation of stairways edging for wood timber steps in accordance with the drawings; the supply and delivery of any other gravel material as required for the installation of the wood timber steps and the complete excavation and grading operations as required to fully install a new wood Timber step unit, the site removal of all existing wood material units and associated metal rebars fittings, the hauling and site disposal of the wood materials to a landfill located outside the Park Boundaries.
The price bid shall also include all costs associated with the provision and requirements of the use of a helicopter service to supply new wood and gravel materials from the staging area to the exact job site location. Contractor is responsible for engaging and providing all necessary safety requirements for the provisions of a helicopter service to provide all the new Wood Timber Materials to the specific job site.
- .2 Measurement will be based on the total number of new Wood Timber Steps; supplied, delivered and completely installed in the finished work as measured by the Owner.
- .3 Partial payment will be made for the FOB to site. Remaining payment will be based on the full unit price per each Wood Timber Step unit completely installed.
- .6 Rock Waterbar
 - .1 The unit price for the completed installation of the “Rock Waterbar” shall be full compensation for all labour, supply, site delivery, of all imported rock materials as required to fully construct a new rock waterbar unit, the supply and delivery of any other gravel material as required for the installation of the waterbar and the complete excavation and grading operations as required to fully install a new rock waterbar unit, the site removal of all existing wood waterbar units and associated metal rebars fittings, the hauling and site disposal of the wood materials to a landfill located outside the Park Boundaries.
The price bid shall also include all costs associated with the provision and requirements of the use of a helicopter service to supply Rock and Gravel materials from the staging area to the exact job site location. Contractor is responsible for engaging and providing all necessary safety requirements for the provisions of a helicopter service to provide all the new Rock Waterbar Materials to the specific job site.
 - .2 Measurement will be based on the total number of Rock Waterbars; supplied, delivered and completely installed in the finished work as measured by the Owner.
 - .3 Payment will be based for the full unit price per each Rock Waterbar unit completely installed.
- .7 Wood Waterbar
 - .1 The unit price for the completed installation of the “Wood Waterbar” shall be full compensation for all labour, supply, site delivery, of all new wood site materials as required to fully construct a new wood waterbar unit, the supply and delivery of any other gravel material as required for the installation of the wood

waterbar and the complete excavation and grading operations as required to fully install a new wood waterbar unit, the site removal of all existing wood waterbar units and associated metal rebars fittings, the hauling and site disposal of the wood materials to a landfill located outside the Park Boundaries.

The price bid shall also include all costs associated with the provision and requirements of the use of a helicopter service to supply Wood and Gravel materials from the staging area to the exact job site location. Contractor is responsible for engaging and providing all necessary safety requirements for the provisions of a helicopter service to provide all the new Wood Waterbar Materials to the specific job site.

- .2 Measurement will be based on the total number of Wood Waterbars supplied, delivered and completely installed in the finished work as measured by the Owner. The quantity of new Wood Waterbars fully completed and approved by Owner will be measured and accepted in the finished work prior to any payment to be made.
- .3 Payment will be provided for the full unit price per each Wood Waterbar unit completely installed.

.8 Drainage Ditch

- .1 The unit price for "Drainage Ditch" shall be considered full compensation for the supply and placement of drainage ditch as shown on the plans. This includes all excavation, backfill, and installation including all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Departmental Representative. Construction will include installation and supply of rock armouring as erosion protection.
- .2 Measurement will be taken per lineal meter of completed new Drainage Ditch; completely excavated to an acceptable drainage grade to be provided on site; the rough and finish work as necessary to fully complete the Drainage Ditch route and; any other minor work as required to fully install the Drainage Ditch
- .3 Payment will be made per lineal meter of completed Drainage Ditch.

- .9 Wood Bench
 - .1 The unit rate price per each “Wood Bench” shall include the supply of all labour, material, plant, and equipment required for the fabrication as required to construct a new Wood Bench unit; the site delivery to the staging area and the site delivery of the Wood Bench to the exact site location; and the complete installation and site finishing at each new wood bench unit location. Contractor is responsible for engaging and providing all necessary safety requirements for the provisions of a helicopter service to provide all the new Wood Bench Materials to the specific job site.
 - .2 Measurement will be taken as the number of wood benches installed and accepted by the Owner.
 - .3 Payment will be per each new Wood Bench installed.
- .10 Hand Rails
 - .1 The unit price bid for “Hand Rails” shall be considered full compensation for all materials, labour and equipment required for the supply, and installation of new handrails, including: procurement, acquisition, loading, hauling, handling, storing, safeguarding, placement, installation, associated clean up and all items incidental to complete the work.
 - .2 Measurement will be taken by lineal metre of handrail installed.
 - .3 Payment will be made for each lineal metre of installed handrails.
- .11 Rock Cobble Wall
 - .1 The unit price bid for “Rock Cobble Wall” shall be considered full compensation for all materials, labour and equipment required for the supply, and installation of all rock cobble stones to be used for complete installation of all new stones and related installation work to fully complete the new stone wall in accordance with the drawings and specification, including: procurement, acquisition, loading, hauling, handling, storing, safeguarding, placement, installation, associated clean up and all items incidental to complete the work.
 - .2 Measurement will be taken by length and width to produce area of wall in square metres.
 - .3 Partial payment will be made for the FOB to site. Remaining payment will be made for each square metre of wall installed
- .12 Provisional - Tree Cutting (0 to 200mm)
 - .1 The unit price bid for tree falling shall be considered full compensation for all materials, labour, safe work practices and equipment required for the cutting of hazard trees identified by the Departmental Representative, including, loading, hauling, handling, safeguarding, associated clean up and all items incidental to complete the work.
 - .2 Measurement will be for the complete cutting of trees with a diameter less than 200mm measured 1.2m above ground surrounding the tree.
 - .3 Payment will be per tree less than 200mm diameter cut down.

- .13 Provisional - Tree Cutting (Under 200mm)
 - .1 The unit price bid for tree falling shall be considered full compensation for all materials, labour, safe work practices and equipment required for the cutting of hazard trees identified by the Departmental Representative, including, loading, hauling, handling, safeguarding, associated clean up and all items incidental to complete the work.
 - .2 Measurement will be for the complete cutting of trees with a diameter greater than 200mm measured 1.2m above ground surrounding the tree.
 - .3 Payment will be per tree greater than 200mm diameter cut down.
- .14 Timber Fence Replacement
 - .1 The unit price bid for “Timber Fence” shall be considered full compensation for all materials, labour and equipment required for the replacement of timber fence, including: procurement, acquisition, loading, hauling, handling, storing, safeguarding, placement, installation, associated removal, clean up and all items incidental to complete the work.
 - .2 Measurement will be take by lineal metre of fence installed.
 - .3 Payment will be made for each lineal metre of installed fence.

2.3 TRAIL WORK – CAMERON FALLS

- .1 New Concrete
 - .1 The unit price bid for “New Concrete” shall be considered full compensation for all materials, labour and equipment required to supply and install concrete structures in accordance with the sections, alignments and grades specified, including: excavation, subgrade preparation, supply and install 100 mm depth granular base, extruding, forming, tie-bar, doweling, placement, vibrating, finishing, stripping, curing and protection of the concrete, control joints expansion joints, isolation joints, backfilling between concrete and property line to subgrade elevation, compaction, associated clean up, and all items incidental to complete the work.
 - .2 Each area of approved new concrete will be measured by length and average width to produce an area in square metres.
 - .3 Payment will be made per square metre of concrete pavement.
- .2 Asphalt Removal
 - .1 The unit price bid for “Asphalt Removal” shall be considered full compensation for all materials, labour and equipment required for removing all asphalt as shown on the drawings, including: removing, breaking, loading, hauling, disposal, associated clean-up and all work incidental to asphalt milling.
 - .2 Each area of approved asphalt removed will be measured by survey to produce an area in square metres.
 - .3 Payment will be made for each square metre of asphalt removed.

- .3 Sub-Grade Preparation
 - .1 The unit price bid for “Sub-Grade Preparation” shall be considered full compensation for all materials, labour and equipment required for preparing the subgrade surface for surfacing, including excavating where required, scarifying, placing, blading, mixing, shaping, grading, moisture conditioning, compacting, maintaining, proof rolling, associated clean up and all work incidental to complete the work. This shall include the undercut and subsequent prep of minor “soft spots” to ensure an approved subgrade surface. Any materials excavated that are not required for subgrade fill on this project shall be considered waste and hauled outside of Waterton Lakes National Park. It is the contractors responsibility to ensure an adequate supply of material is left to balance subgrade construction prior to hauling from the outside the Park.
 - .2 Each area of approved prepared subgrade will be measured by length and average width to produce an area in square metres.
 - .3 Payment will be made for each square metre of approved prepared subgrade surface.
- .4 Granular Base Course – 100 mm Depth
 - .1 The unit price bid for “Granular Base Course – 100 mm Depth” shall be considered full compensation for all materials, labour and equipment required for the supply, placement and compaction of granular base course in accordance with limit lines, compacted depths, densities, moisture content and grades specified, including: procurement, loading, processing, hauling, placing, shaping, grading, compacting, applying blotting sand when required, moisture conditioning, proof rolling, material certification, quality control, associated clean up and all items incidental to complete the work.
 - .2 Each area of approved granular base course will be measured by length and average width to produce an area in square metres.
 - .3 Payment will be made for each area of approved granular base course.
- .5 Type III Asphalt Concrete Paving – 75mm Depth
 - .1 The unit price bid for “Type III Asphalt Concrete Paving – 75 mm Depth” shall be considered full compensation for all materials, labour and equipment required for preparation of the job mix design and job mix formula, supply and placement of prime coat and tack coat where required, supply of aggregates and asphalt cement, mixing, transporting, placing, spreading, shaping, raking, ramping around appurtenances and compacting the asphalt to the specified thickness and density, associated clean up and all work incidental to complete the work.
 - .2 Each area will be measured by survey.
 - .3 Payment will be made for each area of asphalt correctly placed to specifications.

- .6 Pedestrian Bridge Guardrail
 - .1 The unit price bid for “Pedestrian Bridge Guardrail” shall be considered full compensation for all materials, labour and equipment required for the supply, and installation of new guardrail, including: the supply and complete fabrication of the new guardrail sections to be installed; coatings, connections, guardrail installation, associated clean up and all other items incidental to complete the work.
 - .2 Measurement will be taken per lineal metre of installed guardrail.
 - .3 Payment will be made for each lineal metre of installed guardrail.
- .7 Alderson Trail Viewpoint Railing
 - .1 The unit price bid for “Alderson Viewpoint Railing” shall be considered full compensation for all materials, labour and equipment required for the supply, and installation of viewpoint railing, including: the supply and complete fabrication of the new viewpoint railing sections to be installed; coatings, connections, installation of new posts where identified on the drawings, repair and painting of existing posts where identified on the drawings, fencing installation, associated clean up and all other items incidental to complete the work.
 - .2 Measurement will be taken per lineal metre of installed viewpoint railing.
 - .3 Payment will be made for each lineal metre of installed viewpoint railing.
- .8 Hand Rails
 - .1 The unit price bid for “Hand Rails” shall be considered full compensation for all materials, labour and equipment required for the supply, and installation of new handrails, including: procurement, acquisition, loading, hauling, handling, storing, safeguarding, placement, installation, associated clean up and all items incidental to complete the work.
 - .2 Measurement will be taken by lineal metre of handrail installed.
 - .3 Payment will be made for each lineal metre of installed handrails.
- .9 Fence
 - .1 The unit price bid for “Fence ” shall be considered full compensation for all materials, labour and equipment required for the supply, and installation of new fence, including: the supply and complete fabrication of the new fence line sections to be installed; coatings, connections, installation of new posts where identified on the drawings, repair and painting of existing posts where identified on the drawings, fencing installation, associated clean up and all other items incidental to complete the work.
 - .2 Measurement will be taken along the centreline of installed fence for the specified fence type.
 - .3 Payment will be made for each lineal metre of installed fence.

- .10 Rock Cobble wall
 - .1 The unit price bid for “Rock Cobble Wall” shall be considered full compensation for all materials, labour and equipment required for the supply, and installation of all rock cobble stones to be used for complete installation of all new stones and related installation work to fully complete the new stone wall in accordance with the drawings and specification, including: procurement, acquisition, loading, hauling, handling, storing, safeguarding, placement, installation, associated clean up and all items incidental to complete the work.
 - .2 Measurement will be taken by length and width to produce area of wall in square metres.
 - .3 Partial payment will be made for the FOB to site. Remaining payment will be made for each square metre of wall installed
- .11 Topsoil Placement and Grading
 - .1 The unit price bid for “Topsoil Placement and Grading” shall be considered full compensation for all materials, labour and equipment required for the grading and placement of topsoil including: topsoil stripping, cut and break up sod materials into 50mm pieces, screening all materials to 50mm minus size into stockpile, spreading, trimming, blading, shaping finishing, associated clean up and all items incidental to complete the work. The Contractor shall note that topsoil stripping shall be considered incidental to the work.
 - .2 Each top soiled area will be measured by length and average width to produce an area in square metres.
 - .3 Payment will be made for each square metre of area topsoil placed and graded prior to seeding.
- .12 Subgrade Preparation
 - .1 The unit price bid for “Subgrade Preparation” shall be considered full compensation for all materials, labour and equipment required for preparing the trail surface for gravel subgrade, including excavating where required, scarifying, placing, blading, mixing, shaping, grading, moisture conditioning, compacting, maintaining, proof rolling, associated clean up and all work incidental to complete the work. Any materials excavated that are not required for subgrade fill on this project shall be managed on site at the discretion of the Departmental Representative.
 - .2 Each area of approved prepared subgrade will be measured by length and average width to produce an area in square metres.
 - .3 Payment will be made for each square metre of approved prepared subgrade surface.

.13 Seeding

- .1 The unit price bid for “Seeding” shall be considered full compensation for the supply and placement of seed, hydro-mulch and reseeding as applicable, and includes all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Departmental Representative. The repair of eroded areas prior to seeding will be considered incidental to the Work and no separate payment will be made.
- .2 Seeding will be measured in square meters based on horizontal measurements as determined by the Departmental Representative. No allowance will be made for uneven or sloping ground, or overlap.
- .3 Payment for Seeding will be made at the unit price bid per square metre

.14 Trail Subgrade Preparation

- .1 The unit price bid for “Subgrade Preparation” shall be considered full compensation for all materials, labour and equipment required for preparing the trail surface for gravel subgrade, including excavating where required, scarifying, placing, blading, mixing, shaping, grading, moisture conditioning, compacting, maintaining, proof rolling, associated clean up and all work incidental to complete the work. Any materials excavated that are not required for subgrade fill on this project shall be managed on site at the discretion of the Departmental Representative.
- .2 Each area of approved prepared subgrade will be measured by length and average width to produce an area in square metres.
- .3 Payment will be made for each square metre of approved prepared subgrade surface.

.15 Trail Gravel Base

- .1 The unit price for the installation the of the “Gravel Base” shall be full compensation for all labour, supply, site delivery, handling of imported gravel materials at the staging areas, the supply of the base gravel fills from the staging areas to the exact job site locations, mixing of the Portland cement with the gravel fills at the staging area, placement of gravel fills, compaction, and including all work and incidental items for which separate payment is not elsewhere provided.
- .2 Measurement will be based on tonnes of gravel sub base supplied, delivered and completely installed in the finished work as measured by the Owner. Measurement will be based on truck delivery slips provided daily.

No additional payment will be made for supply, and mixing of Portland cement in gravel base, and is considered incidental to the unit price bid.
- .3 Payment will be based on the full unit price per cubic meter of gravel sub base.

.16 Trail Surface Gravel

- .1 The unit price for the installation the of the “Surface Gravel” shall be full compensation for all labour, supply, site delivery, handling of imported gravel materials at the staging areas, the supply of the sub base gravel fills from the staging areas to the exact job site locations, mixing of the Portland cement with the gravel fills at the staging area, placement of gravel fills, compaction, and including all work and incidental items for which separate payment is not elsewhere provided.
- .2 Measurement will be based on tonnes of gravel sub base supplied, delivered and completely installed in the finished work as measured by the Owner. Measurement will be based on truck delivery slips provided daily.
- .3 Payment will be based on the full unit price per cubic meter of surface gravel.

.17 Stone Steps

- .1 The unit price for the completed installation of the “Stone Steps” shall be full compensation for all labour, supply, site delivery, of all concrete materials as required to fully construct a new Stone Step unit, the supply and delivery of any other gravel material as required for the installation of the Stone Step and the complete excavation and grading operations as required to fully install a new Stone Step, the site removal of all existing trail step units and associated metal rebars fittings, the hauling and site disposal of the wood materials to a landfill located outside the Park Boundaries.
- .2 Measurement will be taken based on the total number of new Stone Steps; completely installed to an acceptable finish grade; the rough and finish work as necessary to fully complete the Stone Step.
- .3 Partial payment will be made for the FOB to site. Remaining payment will be made per each 600mm length of Stone Step fully installed.

.18 Rock Waterbar

- .1 The unit price for the completed installation of the “Rock Waterbar” shall be full compensation for all labour, supply, site delivery, of all imported rock materials as required to fully construct a new rock waterbar unit, the supply and delivery of any other gravel material as required for the installation of the waterbar and the complete excavation and grading operations as required to fully install a new rock waterbar unit, the site removal of all existing wood waterbar units and associated metal rebars fittings, the hauling and site disposal of the wood materials to a landfill located outside the Park Boundaries.
- .2 Measurement will be based on the total number of Rock Waterbars; supplied, delivered and completely installed in the finished work as measured by the Owner.
- .3 Payment will be based for the full unit price per Rock Waterbar unit.

.19 Alderson Trail Overlook Deck

- .1 The unit price bid for “Alderson Trail Overlook Deck” shall be considered full compensation for all materials , labour and equipment as required to fully construct a new Alderson Trail Overlook Deck area including removal and disposal of existing structures and concrete foundations, structural design, submittals, fabrication, hauling, helicopter service, excavation, drilling, and all cleaning and installation of the new overlook deck and all work incidental to the installation of the complete Alderson Trail Overlook deck.
- .2 Measurement will be for the completed Alderson Trail Overlook Deck completely installed.
- .3 Payment will be made at the lump sum price bid to construct the Alderson Trail Overlook Deck.

.20 Cameron Falls Lookout 1A Repair

- .1 The unit price bid for “Cameron Falls Lookout 1A Repair” shall be considered full compensation for all materials, labour and equipment as required to fully repair the existing slope area including removal and replacement of existing bench structure and concrete foundations, imported rock materials, placement, , hauling, excavation, top soiling and seeding, and all work incidental to the installation of the complete Cameron Falls Lookout 1A Repair.
- .2 Measurement will be for the completed Cameron Falls Lookout 1A Repair complete.
- .3 Payment will be made at the lump sum price bid to construct the Cameron Falls Lookout 1A Repair complete.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

- .1 Schedule and administer bi-weekly project meetings at the call of Departmental Representative.
- .2 Departmental Representative to provide agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.
- .4 Provide physical space and make arrangements for meetings.
- .5 Departmental Representative to preside at meetings.
- .6 Departmental Representative to record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Departmental Representative to reproduce and distribute copies of minutes within four days after meetings and transmit to meeting participants Departmental Representative.
- .8 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 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Owner, Departmental Representative, Contractor, major Subcontractors, and field inspectors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum five (5) days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16 - Construction Progress Schedules.
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .5 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
 - .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .7 Owner provided products.

- .8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
- .10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
- .11 Monthly progress claims, administrative procedures, photographs, hold backs.
- .12 Appointment of inspection and testing agencies or firms.
- .13 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

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

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 Activity: element of Work performed during course of Project. Activity normally has expected duration and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .3 Construction Work Week: Contractor to provide work week and define schedule calendar working days in Project Execution Plan.
- .4 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .5 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .6 Milestone: significant event in project, usually completion of major deliverable.
- .7 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.
- .8 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 MASTER PLAN

- .1 The Project Schedule, to be prepared within seven (7) days from Award of Contract, is the Master Plan and will be used as baseline for updates.
- .2 Departmental Representative will review and return revised schedules within 3 working days of Award of Contract.
- .3 Revise impractical schedule and resubmit within 3 working days.

1.3 PROJECT SCHEDULE

- .1 Develop Detailed Project Schedule derived from Master Plan within seven (7) days after final approval of Master Plan.
- .2 Ensure Detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings, Samples.
 - .3 Permits.
 - .4 Mobilization.

- .5 Phasing and Trail Completion Milestones
- .6 Concrete Pouring.
- .7 Fence Fabrication.
- .8 Fence Installation.
- .9 Supplied long delivery items.

1.4 REQUIREMENTS

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

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative a Project Schedule, to be prepared within seven (7) days from Award of Contract, as Master Plan for planning, monitoring and reporting of project progress.
- .3 Develop Detailed Project Schedule derived from Master Plan within seven (7) days after final approval of Master Plan.

1.6 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule.
 - .1 Bears Hump Trail Improvements
 - .1 Construction Start-Up: _____
 - .2 Completion of stone step mock-ups: _____
 - .3 Delivery of stone materials to site: _____
 - .4 Construction 50% Complete: _____
 - .5 Installation Completion: _____
 - .6 Final Completion: _____
 - .2 Cameron Falls Area Improvements
 - .1 Construction Start-Up: _____
 - .2 Completion of fence mock-ups: _____
 - .3 Delivery of fencing materials to site: _____
 - .4 Construction 50% Complete: _____
 - .5 Installation Completion: _____
 - .6 Final Completion: _____

1.7 PROJECT SCHEDULE REPORTING

- .1 Update project schedules on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Detailed Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

- .1 Discuss project schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown
- .2 on baseline schedule.
- .3 Weather related delays with their remedial measures will be discussed and negotiated.

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 ADMINISTRATIVE

- .1 Submit to Departmental 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 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.

1.2 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 Alberta, Canada.
- .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 co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 7 days for Departmental Representative review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, 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.
- .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Single line and schematic diagrams.
 - .9 Relationship to adjacent work.
- .9 After Departmental Representative review, distribute copies.
- .10 Submit PDF of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit PDF copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit PDF copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

- .2 Testing must have been within three (3) years of date of contract award for project.
- .13 Submit PDF copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit PDF copies of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit PDF copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit PDF copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .21 The review of shop drawings by Public Works and Government Services Canada (PSPC) is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that PSPC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office.

- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 MOCK-UPS

- .1 Erect mock-ups in accordance with 01 45 00 - Quality Control.
- .2 Mock-Ups to be coordinated with the Departmental Representative for:
 - .1 Rock &/or Wood Steps
 - .2 Rock &/or Wood Water Bars
 - .3 New Lookout Fencing &/or Handrails

1.5 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in jpeg, standard resolution or PDF
- .2 Take daily photographs of all utility and underground work
- .3 Take photographs of site conditions before, during, and after construction. Take photographs of any unique or unusual items.
- .4 Photographs to be submitted on CD. All photographs to be labelled with meaningful titles.

1.6 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.

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 MEASUREMENT AND PAYMENT

- .1 The Cost of helicopter time is not a separate cost and is to be included within the individual work items as per the Measurement and Payment: Section 01 29 00 00

1.2 REFERENCES

- .1 Transport Canada
 - .1 Canadian Transport Act – 1996 and regulations.

1.3 PROTECTION OF PUBLIC

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of airways and roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 When working on travelled way, parking lot, or lifting equipment and materials over:
 - .1 Place equipment in position to minimize interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
 - .3 Do not leave equipment on travelled way overnight.
- .3 Close lanes of roadway only after receipt of written approval from Departmental Representative.
 - .1 Before re-routing or closing to traffic; erect suitable signs and devices to Manual of Uniform Traffic Control Devices for Streets and Highways.

Part 2 Products

2.1 Helicopter Machines Available for Use from Recommended Suppliers are:

- .1 Elbow River Helicopters – BELL 212 - lift capacity: ~3,000 lbs. +/-
- .2 Elbow River Helicopters / Bighorn Helicopters Inc. – ASTAR 350 B3 / Bell 206- lift capacity: ~2,200 lbs. +/-
- .3 Elbow River Helicopters / Bighorn Helicopters Inc. – TBD - lift capacity: ~1,500 lbs. +/-
- .4 Elbow River Helicopters / Bighorn Helicopters Inc. – BELL JETRANGER Bell 407 - lift capacity: ~800 +/-
- .5 Other Bighorn or Elbow River fleet machines as determined by contractor
- .6 The recommended suppliers are provided for convenience only. It is the Contractors responsibility to determine contract agreements and equipment types suitable for the Work.

Part 3 Execution

3.1 Execution Plan

- .1 Contractor is to provide an execution plan for all use of helicopter machines for review and approval prior to booking any helicopter time. Plan is to be updated weekly and as required.
 - .1 Plan is to include:
 - .2 Number of lifts
 - .3 Details of each lift (component, weight, sequence, and other necessary details)
 - .4 Detailed Schedule of each lift
 - .5 Long Line Rigging procedures for each lift
 - .6 Traffic control requirements for each lift
 - .7 Communication procedures
 - .8 Emergency procedures
 - .9 Optimization details of overall lift plan to minimize helicopter use
- .2 Lift Schedule
 - .1 Initial Schedule
 - .2 Rolling two week lift plan
 - .3 Estimated weather days
- .3 Weekly coordination and work plan
- .4 Weekly weather outlook.

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. - Updated 2013.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 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 1 copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly, including minutes of safety toolbox meetings.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets to Departmental Representative.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 3 days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
 - .1 Emergencies: In the event of emergency call 411
 - .2 All other inquiries: Parks Canada Switch Board (403) 859-2224.

1.3 FILING OF NOTICE

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

1.4 SAFETY ASSESSMENT

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

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.7 GENERAL REQUIREMENTS

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

1.8 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.

1.9 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta Reg.
- .2 Comply with R.S.Q., c. S-2.1, an Act respecting Health and Safety, and c. S-2.1, r.4 Safety Code for the Construction Industry.
- .3 Comply with Occupational Health and Safety Regulations, 1996.
- .4 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORSEEN 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 Province having jurisdiction and advise Departmental Representative verbally and in writing.

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 having jurisdiction, and in consultation with Departmental Representative.

1.12 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct noncompliance of health and safety issues identified.
- .3 Departmental 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

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 CONSTRUCTION FIRE SAFETY

- .1 Be responsible for provision of construction fire safety in accordance with National Fire Code of Canada.

1.2 FIRE DEPARTMENT BRIEFING

- .1 Departmental Representative will co-ordinate arrangements for contractor briefing on Fire Safety at pre-work conference with Parks Canada's Fire Superintendent before work is commenced.

1.3 REPORTING FIRES

- .1 Know location of nearest fire alarm box and telephone, including emergency phone number.
- .2 Report immediately fire incidents to Fire Department as follows:
 - .1 Activate nearest fire alarm box; or
 - .2 Telephone.
- .3 When reporting fire by telephone, give location of fire, name or number of building (if applicable) and be prepared to verify location.

1.4 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS

- .1 Fire protection and alarm system will not be:
 - .1 Obstructed;
 - .2 Shut-off; and
 - .3 Left inactive at end of working day or shift without authorization from Fire Superintendent.
- .2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by Fire Superintendent.

1.5 FIRE EXTINGUISHERS

- .1 Supply fire extinguishers, as scaled by Fire Superintendent, necessary to protect work in progress and contractor's physical plant on site.

1.6 BLOCKAGE OF ROADWAYS

- .1 Advise Fire Superintendent of work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by Fire Superintendent, erecting of barricades and digging of trenches.

1.7 SMOKING PRECAUTIONS

- .1 Observe smoking regulations.

1.8 RUBBISH AND WASTE MATERIALS

- .1 Keep rubbish and waste materials at minimum quantities.
- .2 Burning of rubbish is prohibited.
- .3 Removal:
 - .1 Remove rubbish from work site at end of work day or shift or as directed.
- .4 Storage:
 - .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
 - .2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove from site daily.

1.9 FLAMMABLE AND COMBUSTIBLE LIQUIDS

- .1 Handling, storage and use of flammable and combustible liquids governed by current National Fire Code of Canada.
- .2 Keep flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use in quantities not exceeding 45 liters provided they are stored in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
- .3 Storage of quantities of flammable and combustible liquids exceeding 45 liters for work purposes requires permission of Fire Superintendent.
- .4 Transfer of flammable and combustible liquids is prohibited within buildings or jetties.
- .5 Transfer of flammable and combustible liquids will not be carried out in vicinity of open flames or any type of heat-producing devices.
- .6 Do not use flammable liquids having flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents.
- .7 Store flammable and combustible waste liquids, for disposal, in approved containers located in safe ventilated area. Keep quantities minimum and Fire Department is to be notified when disposal is required.

1.10 HAZARDOUS SUBSTANCES

- .1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, in accordance with National Fire Code of Canada.
- .2 Obtain from Fire Superintendent a "Hot Work" permit for work involving welding, burning or use of blowtorches and associated equipment, in buildings or facilities.
- .3 When Work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for Fire Watch is at discretion of Fire Superintendent. Contractors are responsible for providing fire watch service for work on scale established and in conjunction with Fire Superintendent at pre-work conference.

- .4 Provide ventilation where flammable liquids, such as lacquers or urethanes are used, eliminate sources of ignition. Inform Fire Superintendent prior to and at cessation of such work.

1.11 QUESTIONS AND/OR CLARIFICATION

- .1 Direct questions or clarification on Fire Safety in addition to above requirements to Fire Superintendent.

1.12 FIRE INSPECTION

- .1 Co-ordinate site inspections by Fire Superintendent through Departmental Representative.
- .2 Allow Fire Superintendent unrestricted access to work site.
- .3 Co-operate with Fire Superintendent during routine fire safety inspection of work site.
- .4 Immediately remedy unsafe fire situations observed by Fire Superintendent.

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 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Follow requirements as per the WLNP General Project Best Management Practices as outlined in Appendix A.
- .2 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for materials to be installed and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit WHMIS MSDS as requested by Departmental Representative.

1.3 CONTRACTOR'S OPERATIONS

- .1 Confine all operations to work limits as staked or designated by Departmental Representative. No activities of any kind may be carried out beyond those work limits without Departmental Representative's written permission.
- .2 Provide sufficient sanitary facilities and maintain in a clean condition.

1.4 CONTRACTOR'S EMPLOYEE BRIEFING

- .1 Conduct briefing sessions for all employees and sub-contractor employees highlighting requirements of this section, including operation of equipment strictly.

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 SUMMARY

- .1 This Section references to laws, by laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

1.2 REFERENCES TO REGULATORY REQUIREMENTS

- .1 Perform Work in accordance with National Building Code of Canada (NBC) including 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.
- .2 Specific design and performance requirements listed in specifications or indicated on Drawings may exceed minimum requirements established by referenced Building Code; these requirements will govern over the minimum requirements listed in Building Code
 - .1 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.
- .3 Within text of each specification section, reference may be made to reference standards.
- .4 The work shall conform to these reference standards in whole or in part as specifically requested in specifications.

1.3 WHMIS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

1.4 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions and municipal by-laws.

1.5 NATIONAL PARKS ACT

- .1 Contractor and all sub-contractors shall ensure that all work is performed in accordance with ordinances, laws, rules and regulations set out in the National Park Act.
- .2 Contractor and all sub-contractors shall obtain business licenses from Parks Canada Administration Office prior to commencement of work.
- .3 Contractor and all sub-contractors shall comply with all laws and government regulations applicable to work under this contract.
- .4 All Contractor's and all sub-contractor's business and private vehicles are required to obtain vehicle passes from Parks Canada Administration Office.
- .5 Contractor to equip all service vehicles and supervisory vehicles with Emergency Spill Kit DOT-E-10102 or equivalent.

- .6 Contractor is responsible to ensure all sub-contractors comply with the National Park

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 General

- .1 The Contractor is totally responsible for quality of Material and Product which he provides for the Work.
- .2 The Contractor is responsible for quality control and shall perform such inspections and tests as are necessary to ensure that the Work conforms to the requirements of the Contract Documents.
- .3 During the progress of the Work, a sufficient number of tests shall be performed by the Contractor to determine that Material, Product and installation meet the specified requirements.
- .4 Minimum requirements regarding quality control are specified in various sections of the specifications, however, the Contractor shall perform as many inspections and tests as are necessary to ensure that the Work conforms to the requirements of the Contract Documents.
- .5 Testing shall be in accordance with pertinent codes and regulations and with selected standards of the American Society for Testing Materials (ASTM) and Canadian Standards Association (CSA).
- .6 Product testing, mill test and laboratory reports to demonstrate that Product and Material supplied by the Contractor meet the specifications are specified under various sections of the Contract Documents.

1.2 INSPECTION

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

1.3 QUALITY CONTROL TESTING BY THE CONTRACTOR

- .1 The Contractor shall retain the services of an independent testing agency under supervision of a registered professional Engineer, and pay for the cost of testing services for quality control including, but not limited to, the following:
 - .1 Sieve analysis of sands and aggregates to be supplied to the Work.

- .2 Concrete Testing
 - .3 Backfill compaction testing, subgrade, base course and asphalt concrete paving
 - .4 Any product testing that is required and is specified under various sections of the specifications
- .2 The Contractor shall promptly process and distribute all required copies of test reports and test information and related instructions to all of his Subcontractors and Suppliers to ensure that all necessary retesting and replacement of construction can proceed without delay.

1.4 QUALITY ASSURANCE TESTING BY THE OWNER

- .1 The Owner shall retain and pay for the services of an independent testing agency for testing for quality assurance, for the Owner's purposes.
- .2 The Owner's testing agency and the Departmental Representative shall inspect and test Materials, Products and the Work for conformance with the test requirements of the Contract Documents; however, they do not undertake to check the quality of the Work on behalf of the Contractor nor to provide quality control.
- .3 Inspections and test by the Owner's testing agency and by the Departmental Representative do not relieve the Contractor of his responsibility to supply Materials and Products and to perform the Work in accordance with the requirements of the Contract Documents.
- .4 The Departmental Representative, at his discretion, may order or perform any additional inspections and test for purposes of his own or for purposes of the Owner.
- .5 The Contractor shall coordinate with the Departmental Representative the scheduling of testing and inspection by the Owner's testing agencies or by the Departmental Representative, to enable testing to be done as necessary, without delay, and the Contractor shall notify the Departmental Representative sufficiently in advance of operations to allow for such inspection and test by the Departmental Representative's or the Owner's testing agency.

1.5 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.

1.6 PROCEDURES

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

1.7 REJECTED WORK

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

1.8 REPORTS

- .1 Submit one (1) copies of inspection and test reports to Departmental Representative

1.9 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs for items outlined in item 1.3 above and described in the technical specification sections.

1.10 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups 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.
- .5 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.
- .6 Mock-ups may remain as part of Work.
- .7 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.11 MILL TESTS

- .1 Submit mill test certificates as requested.

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 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.2 INSTALLATION AND REMOVAL

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

1.3 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.4 WATER SUPPLY

- .1 Contractor to arrange for temporary water supply for construction.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

1.5 TEMPORARY COMMUNICATION FACILITIES

- .1 Provide and pay for temporary telecommunications hook up, lines, equipment necessary for own use .

1.6 FIRE PROTECTION

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.2 INSTALLATION AND REMOVAL

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

1.3 SCAFFOLDING

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain ramps, scaffolding, temporary stairs, swing staging, ladders, platforms.

1.4 HOISTING

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

1.5 SITE STORAGE/LOADING

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

1.6 CONSTRUCTION PARKING

- .1 Parking will be permitted on site provided it does not disrupt performance of Work or normal operations of the National Park. Parking areas must be approved by Departmental Representative.
- .2 Provide and maintain adequate access to project site.

1.7 SECURITY

- .1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.8 OFFICES

- .1 If required by Contractor, provide office of sufficient size to accommodate required work activities of Contractor and all Sub-Contractors. Departmental Representative to approve location of trailer.
- .2 Contractor is responsible to deal directly with utility companies for any utility hook ups required for site office.
- .3 Provide marked and fully stocked first-aid case in a readily available location.

1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

1.10 SANITARY FACILITIES

- .1 Provide 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.

1.11 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .3 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
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Construct access and haul roads necessary.
- .8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- .9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .10 Dust control: adequate to ensure safe operation at all times.
- .11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.

- .12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .13 Provide snow removal during period of Work.
- .14 Remove, upon completion of work, haul roads designated by Departmental Representative.

1.12 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 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.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Alberta Infrastructure and Transportation
 - .1 Traffic Accommodation in Work Zones -2008.

1.2 PROTECTION OF PUBLIC TRAFFIC

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 When working on travelled way:
 - .1 Place equipment in position to minimize interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
 - .3 Do not leave equipment on travelled way overnight.
- .3 Close lanes of road only after receipt of written approval from Departmental Representative.
 - .1 Before re-routing traffic erect suitable signs and devices to Manual of Uniform Traffic Control Devices for Streets and Highways.
- .4 Keep travelled way graded, free from pot holes and of sufficient width for required number of lanes of traffic.
 - .1 Provide 7 m wide minimum temporary roadway for traffic in two-way sections through Work and on detours.
 - .2 Provide 5 m wide minimum temporary roadway for traffic in one-way sections through Work and on detours.
- .5 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, except where other means of road access exist that meet approval of Departmental Representative.

1.3 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 to Manual of Uniform Traffic Control Devices for Streets and Highways.
- .3 Place signs and other devices in locations recommended in Manual of Uniform Traffic Control Devices for Streets and Highways.

- .4 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.
- .5 Continually maintain traffic control devices in use:
 - .1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
 - .2 Remove or cover signs which do not apply to conditions existing from day to day.

1.4 CONTROL OF PUBLIC TRAFFIC

- .1 Provide competent flag personnel, trained in accordance with, and properly equipped to Manual of Uniform Traffic Control Devices for Streets and Highways for situations as follows:
 - .1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .3 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.
 - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - .5 For emergency protection when other traffic control devices are not readily available.
 - .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
 - .7 At each end of restricted sections where pilot cars are required.
 - .8 Delays to public traffic due to contractor's operators: fifteen (15) minutes maximum.

1.5 CONTROL OF PARKING LOT TRAFFIC

- .1 Repair damage done to existing parking lots caused by any construction activities of this project.
- .2 Erect signs, delineators, barricades and miscellaneous warning devices as required to protect materials stored in the Parking Lot areas.
- .3 Provide and maintain "access to" and "egress from" Parking Lot areas.

1.6 CONTROL OF PEDESTRIAN TRAFFIC

- .1 Provide competent flag personnel, trained in accordance with, and properly equipped to Manual of Uniform Traffic Control Devices for Streets and Highways and provide temporary ramps, walkways and delineation for situations as follows:
 - .2 When public traffic (pedestrian) is required to pass working vehicles or equipment that block all or part of travelled pathway.

- .3 When it is necessary to institute one-way traffic system through construction area or other blockage where volumes are heavy.
- .4 Erect signs, delineators, barricades and miscellaneous warning devices as required advising public of accommodation measures implemented in Parking Lot and Trailhead areas.

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 INSTALLATION AND REMOVAL

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

1.2 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around work areas near cliffs.

1.3 DUST TIGHT SCREENS

- .1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.

1.4 ACCESS TO SITE

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

1.5 PUBLIC TRAFFIC FLOW

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

1.6 FIRE ROUTES

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

1.7 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse or recycling 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 RELATED REQUIREMENTS

- .1 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .2 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility; it is only precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .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.

1.3 AVAILABILITY

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

1.4 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 in a dry location, 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, on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

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

1.6 MANUFACTURER'S INSTRUCTIONS

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

1.7 QUALITY OF WORK

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

- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.8 CO-ORDINATION

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

1.9 SETTING OUT OF WORK

- .1 Departmental Representative will supply two horizontal reference control points with benchmark elevations only for this project.
- .2 Contractor will set grades and layout work in detail from control points.
- .3 Contractor shall employ competent survey staff for complete detailed layout of work.
- .4 Survey supervisor shall have experience in field survey work, including obtaining horizontal and vertical measurements, record keeping and calculation of quantities, generally associated with 3 to 5 years related experience.

1.10 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.

1.11 FASTENINGS

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

1.12 EXISTING UTILITIES

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and pedestrian and vehicular traffic.

- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 QUALIFICATIONS OF SURVEYOR

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

1.2 SURVEY REFERENCE POINTS

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

1.3 SURVEY REQUIREMENTS

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading, fill and topsoil placement and landscaping features.
- .4 Stake slopes.
- .5 All survey required for construction and as-built information to be carried by the Contractor.
- .6 Contractor will be responsible for correction of any error associated with his layout.
- .7 Contractor shall supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .8 Contractor shall supply stakes and other survey markers required for laying out the work.
- .9 Cost of setting out of work will not be paid for directly but shall be considered incidental to contract unit prices tendered.
- .10 Provide AutoCAD as-built drawings to the Departmental Representative.

1.4 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

1.5 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.

- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.7 SUBSURFACE CONDITIONS

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 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 Departmental Representative . Do not burn waste materials on site.
- .3 Clear snow and ice from access to site, bank/pile snow in designated areas.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide and use marked separate bins for recycling. Refer to Section 01 74 19 - Waste Management and Disposal .
- .6 Dispose of waste materials and debris outside of Waterton Lakes National Park.

1.2 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, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .5 Remove dirt and other disfiguration from exterior surfaces.
- .6 Sweep and wash clean paved areas.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19- 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 WASTE MANAGEMENT GOALS

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

1.2 DEFINITIONS

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

1.3 STORAGE, HANDLING AND PROTECTION

- .1 Unless specified otherwise, materials for removal and disposal become Contractor's property.
- .2 Separate recyclable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility. Transport and deliver recyclable items to recycling facilities.
- .3 Protect surface drainage, mechanical and electrical from damage and blockage.
- .4 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.

1.4 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of mineral spirits, paint thinner, oil, volatile materials into waterways, storm, or sanitary sewers.

- .3 Remove materials off-site as Work progresses.

1.5 USE OF SITE AND FACILITIES

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 APPLICATION

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

3.2 CLEANING

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

3.3 DIVERSION OF MATERIALS

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

END OF SECTION

1.1 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 Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative's inspection.
 - .2 Departmental Representative's Inspection:
 - .1 Departmental 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 Equipment and systems: tested, adjusted and fully operational.
 - .4 Certificates required by Utility companies: submitted.
 - .5 Operation of systems: demonstrated to Owner's personnel.
 - .6 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative, and Contractor.
 - .2 When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
 - .7 Final Payment:
 - .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
 - .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 00 – Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19 - 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 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with Departmental Representative, to:
 - .1 Verify Project requirements.
 - .2 Review warranty requirements.
 - .2 Departmental Representative to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 One week prior to Substantial Performance of the Work, submit to the Departmental Representative, two final copies of operating and maintenance manuals in English.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.

1.3 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf [219 x 279] mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content under Section numbers and sequence of Table of Contents.
- .6 Text: manufacturer's printed data, or typewritten data.
- .7 Drawings: provide with reinforced punched binder tab. **AS -BUILT DOCUMENTS**

AND SAMPLES

- .1 Maintain, at site for Departmental Representative one record copy of:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .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 Departmental Representative.

1.5 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of drawings, provided by Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .3 Field changes of dimension and detail.
 - .4 Changes made by change orders.
 - .5 Details not on original Contract Drawings.
 - .6 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.

- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

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 DESCRIPTION OF WORK

- .1 This section specifies requirements for applying and placing stone steps and crushed gravel to lines, grades and typical cross sections indicated on plans, or as established by the Departmental Representative in the field operations and the complete installation of new switchbacks and rock cobble walls with safety handrails for the complete construction of new gravel trails for the Bears Hump Trail Project within Waterton Lakes National Park.
- .2 This section specifies requirements for applying and placing crushed gravel and asphalt to lines, grades and typical cross sections indicated on plans, or established by the Departmental Representative in the field operations and installation of new wood and metal fencing to restore and improve trail safety including stone steps and rock cobble switchback for the Cameron Falls Viewing Area and Alderson Trail within Waterton Lakes National Park.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

Part 2 Products

2.1 SAMPLES

- .1 At least two (2) weeks prior to commencing work, provide the Departmental Representative proposed source of aggregates and provide materials certification of properties below.

2.2 MATERIALS CERTIFICATION

- .1 Aggregates: At least two (2) weeks prior to commencing work provide:
- .2 Test data reports representing granular base and surface gravel processed into stockpile. Submit one (1) complete aggregate gradation analysis report for every 1,000 tonnes of each material required for the project or one complete analysis for each production day when production is less than 1,000 tonnes. Include percentage of crushed course aggregate particles in granular base reports.
- .3 Certification that the physical properties of the aggregates meet the requirements of this section.
- .4 Reports and certification shall be provided by an independent testing consultant under the signature and professional seal of a qualified materials engineer.
- .5 At least two (2) weeks prior to contemplated change in source of aggregates, provide written notification to the Departmental Representative and provide new materials certification in accordance with the requirements of this section.

2.3 GRANULAR TRAIL MATERIALS

- .1 All gravel materials, shall be supplied from borrow pits / stockpiles located outside Waterton Lakes National Park boundary areas. Contractor to purchase, haul and site deliver to the Bears Hump Trail Parking lot area or other specified site location to be located nearby the Parks Government Compound Site at the complete expense to the **Contractor**.
- .2 Crushed stone or gravel consisting of hard, durable, angular particles, free from cementation, organic material, frozen material and other deleterious materials.
- .3 **The 9mm granular trail material is available from nearby borrow pits within the region and is commonly known as an Engineered Rock Material OR as Reject Gravel Materials.** The 9mm size rock is commonly identified as the last waste material from a formal rock crushing contract work to create a 12.5 – 19.0 mm crushed rock material.
- .4 The 25mm granular trail material is available from nearby borrow pits within the region and is commonly known as road crush.

2.4 TRAIL ROCK MATERIALS REQUIRED FOR NEW ROCK STEPS, ROCK WATER BARS AND THE CONSTRUCTION OF THE SIDE WALLS AT THE NEW SWITCHBACK LOCATIONS; AS PER PLANS.

- .1 All rock cobble materials to be used for any rock installation work items within the Bears Hump Trail shall be imported to Waterton Lakes National Park from outside borrow pit / source areas.
- .2 The size of the rock shall range from a 150mm- 200mm average width x 300mm – 400mm average length cobble rock. The imported rock materials shall be a fractured face type of rock material and shall be a firm and dense type of rock. The acceptable type of rock materials is: Wack-quartzite, available from Rock Quarry Borrow Pits. The rocks must be suitable for a masonry work installation and / or at grade rock placement for new construction work details as per the Bears Hump Trail Construction drawings shown.
- .3 The Wack-quartzite rock material is very hard and stackable type of rock which is produced in rock quarries within the Cranbrook BC region. The rock is a dense hard grey thick embedded Wack-Quartzite rock material which is suitable for the use within the Bears Hump Trail Construction Project work. The color ranges from a light tan color to a mixture of light tan and dark tan color within the rock materials. The rock is a dense and hard layered rock which does not flake off easily and remains hard for the lifetime of the rock installation work.
- .4 The rock shall have a uniformly rectangular shape with a fractured face all around the rock cobble material. The rock will be a uniform layered style of rock.
- .5 The color and texture of the new imported rocks to be used within the Trail Project should if at all possible, shall closely resemble the existing on-site rocks located at the Bears Hump Trail and the adjacent areas of the mountain rock areas. Alternative Rock materials resembling the on-site rocks will be reviewed and accepted at the initial construction start-up on site meeting but the Wack-quartzite rock material is an acceptable rock material for the Bears Hump Trail construction works.

- .6 The Contractor must provide at the start up meeting a small sample of the rocks to be used for any rock work item along the Bears Hump Trail. The Departmental Representative will review and approve the Rock Material for use within the project.
- .7 If any large boulders are required for any work item, the Contractor is to supply and install a minimum size of 400mm in average cross-sectional diameter of rock. The type of rock must match with the other rock materials as noted.
- .8 **An acceptable rock supplier is: RSSS QUARRIES LTD. (www.rsssrocks.com) c/o Mr. Rod Roth- Owner**
Office Address: 100 Slater Road NW, Cranbrook BC, Phone: 1- 250-464-9991
Quarry Location Address: Pit #1, Quarry 3.2 km. on the Peavine Main Forestry Cranbrook BC.
- .9 Contractor may or not contact the acceptable Rock Supplier for further information on the rock products, cost of materials and any required hauling from source borrow pit to the Waterton Lakes National Park job location.

2.5 PORTLAND CEMENT ADD-IN MATERIALS

- .1 Contractor shall supply Portland Cement in standard bags. Portland Cement to: CAN/CSA -A3000, Type HE- high early strength, Type HS- sulphate resistant.
- .2 Contractor shall supply Portland Cement in standard containers. The Cement materials shall be mixed into the gravel trail materials at a specific rate of additive add in. The cement materials shall be mixed into the gravel materials at a rate of 5% of the total volume of each bag of gravel materials to be flown to the exact job site location on the Bears Hump Trail. This mixture will be reviewed during the construction phase and may be adjusted by the Departmental Representative in order to achieve the exact mixture necessary for the new gravel trail improvements.
- .3 The purpose of the gravel and the cement mixture is to create a stronger base gravel and surface gravel layer within the Bears Hump and Alderson Trail Improvements. Previous construction work did not have this amendment added and it is to be used during this contract work. The mixture will be used in BOTH THE BASE LAYER AND THE SURFACE LAYER.
- .4 The new switchback areas will use this mixture of gravel for the base areas within the existing rocky edges and exposed bedrock switchbacks. The Contractor is required to install a maximum of 200mm (8") lift of base gravel mixture at the switchback locations. The layer is to be completely compacted and rough finished and ready for the additional and final layers of surface gravel fills. This method will be to create a strong and compacted fill section which will be used for the stair tread and the new rock wall structure to be installed at the switchback location.

2.6 SWITCHBACK ROCK STEP MATERIALS

- .1 The new Rock Materials to be used for the construction of the Switchback Areas will be:
A Wack-quartzite, available from Rock Quarry Borrow Pits. The Wack-quartzite rock material is very hard and stackable type of rock which is produced in rock quarries within the Cranbrook BC region. The rock is a dense hard grey thick embedded Wack-Quartzite rock material which is suitable for the use within the Bears Hump Trail

Construction Project Switchback Work. The color ranges from a light tan color to a mixture of light tan and dark tan color within the rock materials. The rock is a dense and hard layered rock which does not flake off easily and remains hard for the lifetime of the rock installation work.

- .2 The required rock steps to be used in the construction of the new Switchbacks shall be a Wack-quartzite rock which shall be provided from a Rock Quarry and shall be prepared with suitable and efficient rock cutting equipment. The natural rock shall be dimensionally cut and a prepared rock step prepared with a riser height of 200mm (8" riser) and with a cut tread width of 300mm (12" tread). The overall shape of the rock step shall be rectangular shape which is easily suitable for the construction of the new Stone Stairway construction work. The stone has a specific gravity of 2.73 lbs. or 2730 kg. per cubic meter, OR 170 lbs. per each cubic foot. This rock is very dense, heavy and will be suitable for use within the project work.
- .3 The rock step unit shall have the cut face installed on the lower base area and the finished cut face will be on the riser and tread areas. The riser face perimeter edges will have hand chiseled rock finished edge and the front of the riser shall be finished with an acetylene fired face flamed onto the riser face to create natural stone surface suitable for aesthetics.
- .4 The finished rock step shall be placed and packaged onto a wood palette and be ready for all trucking and hauling work. The new finished rock step shall be completely washed and free of any noxious weed and dirt materials.
- .5 The size of the new Stone Step unit shall be a cut stone width of 1.2 meters (48 ") in overall length and then shall be cut to a **Final Length of 0.6 meters (24") length**. This shorter length of stone section is to be used for an easier on-site installation work at the exact step area at the new Switchback location. The unit can be handled by a crew of men to position and fully place the new stone step unit. The exact method of installation is to be determined by the Contractor and paid for at a unit cost per each 0.6-meter-long Stone Step unit. The 0.6-meter-long step shall be used to create a larger landing area at the upper Switchback areas in order to make for easier access and for passing of users on the Trail Route.
- .6 **Certification of Weed Free Rock Quarry:** The supplier of the new Rock Cut Steps and Rock materials shall provide a certificate of invasive weed free identification of the Rock Quarry by the Provincial Government.
- .7 All the trucks used in the hauling and supply of any Cut Stone Steps must be **thoroughly cleaned prior to entering into the National Park areas.**

2.7 ROCK WATERBAR MATERIAL

- .1 The rock product is a screened drainage material ranging in gradation from 25mm to 80mm in average cross section. The drainage stone contains voids in aggregate. The Contractor to construct a 150mm depression in the compacted and prepared trail base prior to installation of the new rock waterbars. Install compacted drainage rock materials at a 30 - 40 degree angle to the trail surface. Rock Waterbars are to extend 1.0m from the edge of the trail to deflect the run-off water from the trail surface. Extend into vegetation a max of 1.0m. The crushed stone materials shall be thoroughly washed to remove any noxious weeds at the pit area prior to any hauling work done to the National Park areas. All trucking and hauling work is part of the Contractor's costs borne within the unit price costs.

2.8 ROCK MORTAR

- .1 There is a need for an industrial cementitious mortar grout cement to be used within the trail construction. Contractor shall provide details of exact mortar grout / cement to the Departmental Representative at the start up meeting. The mortar will be used in the installation of the rock cobble walls at the new Switchback Areas.

Part 3 Execution

3.1 INSPECTION

- .1 Before proceeding with any trail construction work a good understanding of the work conditions and the schedule of work is to be identified by the Contractor and the Departmental Representative at the initial start up meeting. Cooperation and agreement on the methods to complete the trail work is highly important to achieve a successful trail project work.
- .2 The trail route will be staked and or identified by the Departmental Representative and be ready for the Contractor to complete all work items of the contract.

3.2 TREE CLEARING

- .1 The trail route is located within the 2017 major forest fire area within the Park. There are burnt trees adjacent to the trail and the Contractor is to cut down the immediate trees which may affect the Trail Construction Work.

3.3 PREPARATION

- .1 The Contractor shall maintain the subgrade to the specified section, free from ruts, waves and undulations until granular sub-base material is placed. The subgrade shall be in a firm dry condition and must be approved by the Departmental Representative before gravel is placed. The depositing of granular base or sub-base on a soft, muddy or rutted subgrade will not be permitted.

3.4 EQUIPMENT AND WORK PLACE

- .1 Standard Landscape Construction Hand and Portable equipment shall be used for all construction work. The Bears Hump Trail is not easily accessible with motorized equipment and other commonly used construction work equipment. The Contractor must be very familiar with the terrain, the steep grades, bedrock materials present along the trail route and the mountain side slopes which the Bears Hump Trail route is within.
- .2 The Contract work involves a major amount of hard and physical work in order to: deliver the equipment and materials to the exact job site located along the trail route; the physical nature of working within a back-country style of trail route; and the knowledge and history of working with a helicopter service company to delivery materials and equipment from the staging areas to the exact location along the Bears Hump Trail.
- .3 The Departmental Representative shall approve all operations during the term of the project work. The Departmental Representative and the Contractor must work together in a mutual respectful manner in order to achieve a quality end product of trail reconstruction work. This respect and cooperation must be done to fully understand the

conditions of trail present and the best method of construction method for the installation and construction of the gravel trails and the rock switchback installation works.

3.5 TRAIL COMPACTION

- .1 Compact all sub-grade and base areas to a 95% standard proctor density suitable for a hiking traffic use only. Ensure a good cross or crown slope is made at the top area of the trail surfaces.
- .2 Apply additional water for compaction if necessary. The water for the construction work is available at the Parks Compound location. Departmental Representative shall provide details on location and use of the water source. Contractor to provide all fittings, hoses, containers and may use a helicopter to fly in the water containers for use in compaction and as well as for use within any on site mixes of the gravel and cement materials.

3.6 TRAIL CONSTRUCTION

- .1 The trail is situated on a very dense till area and a bedrock area location. There will not be any major excavations required for the new work. The intent is to fill the trail route with gravel fills and a finish gravel surfacing onto the existing trail areas.
- .2 The gravel shall be as per specifications in Part 2- Products and Section 310516 Aggregate Materials. The gravel mixture shall be mixed within the bags of gravel materials which may be flown by helicopter to the exact site location along the trail route, during construction work. It may be necessary to mix the gravel and cement materials on site within the trail route and the mixture shall be as specified.
- .3 The Contractor shall complete all work identified within the Construction Drawings for the new Trail Improvements.
- .4 The existing wood timber stairs and the existing re-bars are to be removed and disposed of outside the Park boundaries.
- .5 The gravel base layer is to be maintained as a cohesive and one-unit layer until the surface gravel mixture is to be installed. In-fill the base layer with additional fills if base layer is affected.

3.7 ROCK SWITCHBACK CONSTRUCTION

- .1 Contractor shall inspect the existing trail route and the specific rock switchbacks to be built as part of the contract work. The Contractor is to remove any as found wood timber c/w metal rebar fasteners from the switchback areas.
- .2 The Contractor shall supply, deliver, and fly into the trail route all cut stone rock steps AND the crushed drainage rock materials to be used for the construction of the new rock switchbacks. Contractor to provide a small sample and the site location of the rock to be imported to the Park to the Departmental Representative at time of start up meeting. Approval will be provided at this meeting. The rocks **must** be a very clean rock material and free of native noxious weeds or cover.
- .3 The method of rock installation is to create a compacted sub base fill layer and to fully compact each layer well. Install the cut rock step materials to create a formal rock stairway and with a new side cobble rock wall c/w a sloping batter on each side wall unit and install a cement mortar within the rock materials in order to create a strong and bonded wall and

- .4 The Departmental Representative shall direct operations and both the Contractor and Departmental Representative shall review and develop an exact on-site method of rock wall installation which will be the most efficient and well-constructed method for the overall construction of the new switchback wall units and the gravel in fills as required. Cooperation between the Contractor and the Departmental Representative is required in order to make the trail construction process to be a mutually respectful job.

3.8 ROCK WATERBAR CONSTRUCTION AND ROCK STEPS CONSTRUCTION

- .1 Contractor shall remove all existing wood waterbars and remove the materials outside the Park area for disposal. The Contractor is to review with the Departmental Representative the exact location and the use / intent of the new rock waterbar to be installed at numerous locations along the Bears Hump Trail route.
- .2 Contractor shall supply, deliver and fully install all imported gravel, and rock materials necessary to build a new rock waterbar and rock steps as required, at specified site location. The materials may be delivered to the exact job site location along the Trail Route via a use of a helicopter service. The materials are to be placed in heavy duty bags at the staging area and then flown into the job site area by the Contractor. All helicopter costs are to borne by the Contractor. All necessary Safety Requirements shall be used during any helicopter operations and are also extended to the Contractors Workers present at the job site location along the Bears Hump Trail.
- .3 All exposed vertical stone surfaces shall be backfilled within one week of placing the stone steps to prevent undermining from runoff. The Contractor shall place 25 mm minus crushed gravel backfill a minimum of 50 mm above the bottom of the step, around all exposed vertical faces, to re-direct run-off away from the step.

3.9 WATER RUN OFF DRAINAGE DITCH CONSTRUCTION

- .1 Contractor shall create a new drainage ditch / routes off the trail area in order to allow for any major rainfalls or water discharges to occur off the trail route areas. The Departmental Representative shall locate and direct all on-site works, prior to the work being completed.

3.10 FINISH TOLERANCES

- .1 Finished sub-base and base surfaces shall be within plus or minus 10 mm of established grade, but not uniformly high or low.
- .2 Correct surface irregularities by loosening and adding or removing materials until surface is within the specified tolerances.

3.11 MAINTENANCE

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

3.12 TESTING

- .1 The Contractor shall perform quality control tests to show conformity to technical specifications.

- .2 The Departmental Representative may perform quality assurance tests for acceptance in accordance with the requirements of this section. Test data provided shall be final and binding on both the Department and the Contractor.

END OF SECTION

Part 1 General

1.1 NOT USED

- .1 Not Used

Part 2 Products

2.1 EQUIPMENT

- .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 PREPARATION

- .1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

3.2 REMOVAL OF HAZARDOUS WASTES

- .1 Remove contaminated or dangerous materials defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

3.3 REMOVAL OPERATIONS

- .1 Remove items as indicated.
- .2 Do not disturb items designated to remain in place.
- .3 Removal of pavements, and concrete:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Departmental Representative.
 - .2 Protect adjacent joints and load transfer devices.
 - .3 Protect underlying and adjacent granular materials.
- .4 Prevent contamination with base course aggregates, when removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving.
- .5 Remove designated trees during demolition.
 - .1 Obtain written approval of Departmental Representative prior to removal of trees not designated.
- .6 Stockpile topsoil for final grading and landscaping:

- .1 Screen organic stripping materials to 50mm minus then stockpile at location at Upper Compound location approximately 3.5kms from site as directed by Departmental Representative.
- .2 Provide erosion control and seeding if not immediately used.
- .7 Disposal of Material:
 - .1 Dispose of materials not designated for salvage to approved disposal facility outside of Waterton Park or reuse on site as instructed by Departmental Representative.
 - .2 All excess subgrade materials from the Cameron Falls area shall become waste material and hauled outside Waterton Park.
 - .3 All excess subgrade materials from the Bears Hump Trail shall be disposed on site.
- .8 Backfill:
 - .1 Backfill in areas as indicated and in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.4 STOCKPILING

- .1 Label stockpiles, indicating material type and quantity.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .3 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.
- .4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.5 RESTORATION

- .1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.
- .2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Remove debris, trim surfaces and leave work site clean, upon completion of Work
 - .3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.7 PROTECTION

- .1 Repair damage to adjacent materials or property caused by selective site demolition.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 30 00 Cast in Place Concrete.

1.2 REFERENCE STANDARDS

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A143/A143M- 07 (2014) , Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - .2 ASTM A641/A641M- 09a(2014) , Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - .3 ASTM A775/A775M- 16 , Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
 - .4 ASTM A 884/A 884M- 14 Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
 - .5 ASTM A 1064/A 1064M- 16b , Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- .2 CSA Group
 - .1 CSA-A23.1- 14 /A23.2- 14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3- 14, Design of Concrete Structures.
 - .3 CSA-G30.18- 09 (R2014), Carbon Steel Bars for Concrete Reinforcement.
 - .4 CSA-G40.20/G40.21- 13 (R2014) , General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .5 CAN/CSA-G164- M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .6 CSA W186- M1990 (R2016), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .3 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Alberta, Canada.
 - .1 Prepare reinforcement drawings in accordance with SP-66 and RSIC Manual of Standard Practice.
 - .2 Indicate placing of reinforcement and:

- .1 Bar bending details.
- .2 Lists.
- .3 Quantities of reinforcement.
- .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
- .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.
- .3 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.
 - .1 Provide type B tension lap splices unless otherwise indicated.
- .3 Quality Assurance Submittals:
 - .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
 - .2 Mill Test Report: upon request, submit to Departmental Representative certified copy of mill test report of reinforcing steel.
 - .3 Upon request submit in writing to Departmental Representative proposed source of reinforcement material.

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, off ground, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.
- .4 Cold-drawn annealed steel wire ties: to ASTM 1064/A 1064M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM 1064/A 1064M.
- .6 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

- .7 Tie wire: 1.5 mm diameter annealed wire.
- .8 Mechanical splices: subject to approval of Departmental Representative.
- .9 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada and CSA-A23.1/A23.2.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.
- .2 Upon request inform Departmental Representative of proposed source of supplied material.

Part 3 Execution

3.1 PREPARATION

- .1 Galvanizing to include chromate treatment.
 - .1 Duration of treatment 1 hour per 25 mm of bar diameter.
- .2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

3.2 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.3 PLACING REINFORCEMENT

- .1 Cutting or puncturing vapour retarder is not permitted; repair damage and reseal vapour retarder before placing concrete.
- .2 Place reinforcing steel as indicated on shop drawings in accordance with CSA-A23.1/A23.2.
- .3 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

- .4 Maintain cover to reinforcement during concrete pour.

3.4 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
 - .1 Reinforcing steel and welded wire fabric.
- .2 Inspection and testing of reinforcing and reinforcing materials carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
 - .1 Ensure testing laboratory certified to CSA A283.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - 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 00 - Cleaning.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish, and limitations.
 - .2 Submit WHMIS MSDS in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Provide testing results for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.
- .3 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.2 QUALITY ASSURANCE

- .1 Provide to Departmental Representative, 2 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.
 - .1 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
 - .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.
 - .2 Deviations to be submitted for review by the Departmental Representative.
- .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.4 SITE CONDITIONS

- .1 Placing concrete during rain or weather events that could damage concrete is prohibited.
- .2 Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.
- .3 Cold weather protection:
 - .1 Maintain protection equipment, in readiness on Site.

- .2 Use such equipment when ambient temperature below 5°C, or when temperature may fall below 5°C before concrete cured.
- .3 Placing concrete upon or against surface at temperature below 5°C is prohibited.
- .4 Hot weather protection:
 - .1 Protect concrete from direct sunlight when ambient temperature above 27°C.
 - .2 Prevent forms of getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely.
- .5 Protect from drying.

Part 2 Products

2.1 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets specifications performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.2 MATERIALS

- .1 Cement: to CSA A3001, Type HSb.
- .2 Water: to CSA A23.1/A23.2.
- .3 Reinforcing steel: to CAN/CSA-G30.18.
- .4 Aggregates: to CSA A23.1/A23.2.
- .5 Admixtures:
 - .1 Air entraining admixture: to ASTM C260.
 - .2 Chemical admixture: to ASTM C494 and ASTM C1017. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .6 Other concrete materials: to CSA A23.1/A23.2.

2.3 MIXES

- .1 Proportion concrete in accordance with CAN/CSA-A23.1.
- .2 Minimum 28 day compressive strengths and exposure classifications:
 - .1 All concrete: 32 MPa; C-2.
- .3 Nominal size of coarse aggregate: Clause 14 of CAN/CSA-A23.1.
- .4 Slump: to Table 6 of CAN/CSA-A23.1.
- .5 Air content: all concrete to contain purposely entrained air in accordance with Table 10 of CAN/CSA-A23.1.
- .6 Admixtures: to Clause 6 of CAN/CSA-A23.1.

Part 3 Execution

3.1 PREPARATION

- .1 Provide Departmental Representative 24 hours notice before each concrete pour.
- .2 Place concrete reinforcing in accordance with Section 03 20 00- Concrete Reinforcing.
- .3 During concreting operations:
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of rehandling and without damage to existing structure or Work.
- .4 Disturbing reinforcement and inserts during concrete placement is prohibited.
- .5 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .6 Protect previous Work from staining.
- .7 Clean and remove stains prior to application for concrete finishes.
- .8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature and test samples taken.

3.2 INSTALLATION/APPLICATION

- .1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.
- .2 Sleeves and inserts:
 - .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in.
 - .2 Sleeves and openings greater than 100 mm x 100 mm not indicated, must be reviewed by Departmental Representative.
- .3 Anchor bolts:
 - .1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.
 - .2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Departmental Representative.
 - .1 Drilled holes: to manufacturers' recommendations 25 mm minimum diameter larger than bolts used.
 - .3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.
 - .4 Set bolts and fill holes with approved non-shrink grout.

3.3 FINISHES

- .1 Formed surfaces exposed to view: sack rubbed finish in accordance with CSA A23.1/A23.2.
- .2 Pavements, walks, curbs and exposed site concrete:
 - .1 Screed to plane surfaces and use wood floats.
 - .2 Provide round edges and joint spacings using standard tools.

- .3 Trowel smooth to provide lightly brushed non-slip finish.

3.4 CURING

- .1 Cure to CSA A23.1/A23.2 Table 19.

3.5 SITE TOLERANCES

- .1 Concrete finishing tolerance to CSA A23.1/A23.2.

3.6 FIELD QUALITY CONTROL

- .1 Concrete testing: to CSA A23.1/A23.2 by designated testing laboratory.

3.7 CLEANING

- .1 Clean in accordance with Section 01 74 00 - Cleaning.
- .2 Use trigger operated spray nozzles for water hoses.
- .3 Designate cleaning area for tools to limit water use and runoff.
- .4 Cleaning of concrete equipment to be done in accordance with Section 01 35 43 Environmental Procedures.

END OF SECTION

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A 53/A 53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A269M-15a, Standard Specification for Seamless and Welded Austenitic Stainless-Steel Tubing for General Service.
 - .3 ASTM A307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA Group
 - .1 CSA G40.20-13 /G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-S6-14 [16], Canadian Highway Bridge Design Code.
 - .3 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .4 CSA S16-14, Design of Steel Structures.
 - .5 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .6 CSA W59-13, Welded Steel Construction (Metal Arc Welding) [Metric].
- .3 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - [current edition].
- .4 ULC Standards
 - .1 UL 2768-2011, Architectural Surface Coatings.
 - .2 UL 2760-2011, Surface Coatings - Recycled Water-borne.

1.2 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 sections, pipe, bolts, tubing, plates and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit WHMIS MSDS in accordance with Section 01 35 43 - Environmental Procedures.
 - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Alberta, Canada.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.3 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .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 off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.
- .2 Hollow Structural Steel sections and W Sections: to CSA G40.20/G40.21, Grade 350W.
- .3 Steel pipe: to ASTM A53/A53M standard weight, galvanized finish.
- .4 Welding materials: to CSA W59.
- .5 Welding electrodes: to CSA W48 Series.
- .6 Bolts and anchor bolts: to ASTM A307.
- .7 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

- .1 Fabricate work square, true, straight, and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.
- .2 Shop coat primer: in accordance with chemical component limits and restrictions requirements and VOC limits of GS-11.

2.4 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Paint when temperature minimum 7 degrees C.
- .3 Clean surfaces to be field welded; do not paint.

2.5 MISCELLANEOUS METAL COMPONENTS

- .1 All metal on project shall be steel (including rails, posts, park bench frames, connection plates, bolts, etc.).
- .2 Galvanize metal components after fabrication, unless indicated otherwise on the drawings.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions remedied and after receipt of written approval to proceed Departmental Representative.

3.2 ERECTION - GENERAL

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CSA S16 or Weld field connection.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .8 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.3 MISCELLANEOUS METAL COMPONENTS

- .1 Install metal components as indicated on the drawings.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA International
 - .1 CSA B111, Wire Nails, Spikes and Staples.
 - .2 CAN/CSA O80 Series, Wood Preservation.
 - .3 CSA O86 Consolidation, Engineering Design in Wood.
 - .4 CAN/CSA-Z809, Sustainable Forest Management.
- .3 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001, FSC Principle and Criteria for Forest Stewardship.
- .4 Green Seal Environmental Standards (GS)
 - .1 GS-36, Commercial Adhesives.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber.
- .7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113, Architectural Coatings.
 - .2 SCAQMD Rule 1168, Adhesives and Sealants Applications.
- .8 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.

1.2 ACTION AND INFORMATION 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 wood posts and rails and include product characteristics, performance criteria, physical size, finish and limitations if requested by Departmental Representative.
 - .2 Submit PDF copies of WHMIS MSDS if requested by Departmental Representative.

- .3 Shop Drawings, if requested by Departmental Representative:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Alberta, Canada.
- .4 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.
- .5 Sustainable Design Submittals:
 - .1 Wood Certification: submit manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.

1.3 QUALITY ASSURANCE

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Sustainable Standards Certification:
 - .1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 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 in clean, dry, well-ventilated area.
 - .2 Store and protect wood decking from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Wood: to NLGA standard Grading Rules for Canadian Lumber
- .2 All wood shall be a Western Red Cedar Wood of Select Structural Grade as per CSA O86. Wood shall be sound and free of major checks and cracks. Departmental Representative shall inspect and either reject or approve all wood to be used within the new Fence Line and View Point Construction.
- .3 Wood Bench Units: shall be constructed from Western Red Cedar members and shall be Select Structural Grade. Wood bench units if at all possible shall be built within an enclosed shop office building located off site from the Bears Hump Trail area. The new Bench is to be delivered and flown into the exact position to be situated along the Bears Hump Trail at the locations identified and as per the directions of the on-site Departmental Representative.

- .4 All wood materials shall be a 15% maximum moisture content.
 - .1 CAN/CSA-Z809 or FSC or SFI certified.
- .5 Wood Decking lengths: 1.8 to 6 m or longer with a minimum of 90% planks exceeding 3 m. For single spans shorter than 3 m use decking of same length as span (IF REQUIRED)
- .6 All Wood Rails shall be one continuous member without joints between a maximum of two posts.
- .7 Nails: to CSA B111, galvanized, finish; sizes to CSA O86. Supply 200 mm spiral spikes for lateral nailing.
- .8 Bolts: shall be CSA B111, galvanized finish c/w large heavy-duty metal washers and nuts for fastening all members of fence together. Ensure a clean and neat connection results.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for wood decking installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION FOR VIEWPOINT DECK AND FENCE

- .1 Complete wood fence line work to CSA O86 except where specified otherwise
- .2 Complete wood deck work to CSA O86 except where specified otherwise
- .3 Install posts as per the plan details and adjacent to the Cameron Falls Viewpoint Area and along the existing Cameron Falls Trail Uphill Route, as per plan drawing
- .4 Install additional post supports if required prior to attachment of rails
- .5 **DO NOT APPLY ANY PRESERVATIVE ONTO ANY WOOD PRODUCT AS THIS IS NOT ALLOWED IN THE NATIONAL PARK AREA.**
- .6 Joints in wood:
 - .1 Separate joints in same area by at least 2 intervening courses
 - .2 Avoid joints in first fifth of end spans
 - .3 Minimize joints in middle third of span

3.3 INSTALLATION FOR POST AND RAIL FENCE

- .1 Complete wood fence line work to CSA O86 except where specified otherwise
- .2 Install posts as per the plan details and adjacent to the Bears Hump Trail Route

- .3 Install additional post supports if required prior to attachment of rails
- .4 DO NOT APPLY ANY PRESERVATIVE ONTO ANY WOOD PRODUCT AS THIS IS NOT ALLOWED IN THE NATIONAL PARK AREA.**
- .5 Joints in wood:
 - .1 Separate joints in same area by at least 2 intervening courses
 - .2 Avoid joints in first fifth of end spans
 - .3 Minimize joints in middle third of span

3.4 FIELD QUALITY CONTROL

- .1 Testing: if requested
 - .1 Testing moisture content of delivered material will be performed by testing laboratory designated by Contractor.
 - .2 Quality Assurance testing in accordance with Section 01 45 00 Quality Control.
 - .3 Testing moisture content of delivered material will be by moisture meter with adjustments for species and temperature by testing laboratory designated by Contractor.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 -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 00 - Cleaning.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures and Section 02 22 29 Trail Site Work.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations
- .3 Samples:
 - .1 Submit 1 sample.
 - .2 Allow continual sampling by Departmental Representative during production.
 - .3 Provide Departmental Representative with access to source and processed material for sampling.
 - .4 Supply new or clean sample bags or containers according appropriate to aggregate materials.
 - .5 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

Part 2 Products

2.1 Granular Materials

- .1 All rock materials to be used for any rock installation work items within the Bears Hump Trail shall be imported to Waterton Lakes National Park from outside borrow pit / source areas.
- .2 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .3 Flat and elongated particles of coarse aggregate: to ASTM D 4791.
 - .1 Greatest dimension to exceed 5 times least dimension.
- .4 Fine aggregates satisfying requirements of Section 02 22 29 Trail Site Work to be one, or blend of following:
 - .1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
- .5 Coarse aggregates satisfying requirements of Section 02 22 29 Trail Site Work to be one of or blend of following:
 - .1 Crushed rock.
 - .2 Crushed gravel composed of naturally formed particles of stone.
- .6 Gradation to be within the following limits when tested to ASTM C-117 with sieve sizes to CAN/CGSBD 8-GP-2M rather than ASTM E11, and to have a smooth curve without

sharp breaks when plotted on a semi-log grading chart.

.7 Physical properties of Aggregates:

% Fracture, by weight (2 faces)	60 min.
Los Angeles Abrasion, loss, %	45 max.
Liquid Limit, %	25 max.
Plasticity Index, %	6 max.
Lightweight Particles, %	5 max.
California Bearing Ratio, when compacted to 100% of ASTM D698 Execution	80 min.

.8 Base Gravel Aggregate shall meet the following:

Sieve Size	Percent Passing by Weight
25 000	100
20 000	82-97
16 000	70-94
10 000	52-79
5 000	35-64
1 250	18-43
630	12-34
315	8-26
160	5-18
80	2-10

.9 Trail Surface Gravel Aggregate shall meet the following:

Sieve Size	Percent Passing by Weight
9 000	90-100
4 500	70-100
425	40-70
75	8-40

.10 Crushed Rock particles: at least 60% of the particles by mass within each sieve designation range to have one freshly fractured face. Material to be divided into ranges using methods of ASTM C136. The trail gravels shall have a 25% percentage of clay or silty materials within the trail gravel mixture.

2.2 Trail Rock Materials Required for new Rock Steps, Rock Water Bars and the construction of the Rock Cobble walls at the New Switchback Locations; as per plans.

.1 Rock Cobble

- .1 The size of the rock shall range from a 150mm- 200mm average width x 300mm – 400mm average length cobble rock. The imported rock materials shall be a fractured face type of rock material and shall be a firm and dense type of rock. The acceptable type of rock materials is: **Wack-quartzite, available from Rock Quarry Borrow Pits.** The rocks must be suitable for a masonry work installation and / or at grade rock placement for new construction work details as per the Bears Hump Trail Construction drawings shown.
- .2 The Wack-quartzite rock material is very hard and stackable type of rock which is produced in rock quarries within the Cranbrook BC region. The rock is a dense hard grey thick embedded Wack-Quartzite rock material which is suitable for the use within the Bears Hump Trail Construction Project work. The color ranges from a light tan color to a mixture of light tan and dark tan color within the rock materials. The rock is a dense and hard layered rock which does not flake off easily and remains hard for the lifetime of the rock installation work.
- .3 The rock shall have a uniformly rectangular shape with a fractured face all around the rock cobble material. The rock will be a uniform layered style of rock.
- .4 The color and texture of the new imported rocks to be used within the Trail Project should if at all possible, shall closely resemble the existing on-site rocks located at the Bears Hump Trail and the adjacent areas of the mountain rock areas. Alternative Rock materials resembling the on-site rocks will be reviewed and accepted at the initial construction start-up on site meeting but the Wack-quartzite rock material is an acceptable rock material for the Bears Hump Trail construction works.
- .5 The Contractor must provide at the start up meeting a small sample of the rocks to be used for any rock work item along the Bears Hump Trail. The Departmental Representative will review and approve the Rock Material for use within the project.
- .6 If any large boulders are required for any work item, the Contractor is to supply and install a minimum size of 400mm in average cross-sectional diameter of rock. The type of rock must match with the other rock materials as noted.

.2 Rock Steps

- .1 The new Rock Materials to be used for the construction of the stone steps in the Switchback Areas will be: **A Wack-quartzite, available from Rock Quarry Borrow Pits.** The Wack-quartzite rock material is very hard and stackable type of rock which is produced in rock quarries within the Cranbrook BC region. The rock is a dense hard grey thick embedded Wack-Quartzite rock material which is suitable for the use within the Bears Hump Trail Construction Project Switchback Work. The color ranges from a light tan color to a mixture of light tan and dark tan color within the rock materials. The rock is a dense and hard layered rock which does not flake off easily and remains hard for the lifetime of the rock installation work.

- .2 The required rock steps to be used in the construction of the new Switchbacks shall be a Wack-quartzite rock which shall be provided from a Rock Quarry and shall be prepared with suitable and efficient rock cutting equipment. The natural rock shall be dimensionally cut and a prepared rock step prepared with a riser height of 200mm (8" riser) and with a cut tread width of 300mm (12" tread). The overall shape of the rock step shall be rectangular shape which is easily suitable for the construction of the new Rock Switchback Stairway construction work. The stone has a specific gravity of 2.73 lbs. or 2730 kg. per cubic meter, OR 170 lbs. per each cubic foot. This rock is very dense, heavy and will be suitable for use within the project work.
 - .3 The rock step unit shall have the cut face installed on the lower base area and the finished cut face will be on the riser and tread areas. The riser face perimeter edges will have hand chiseled rock finished edge and the front of the riser shall be finished with an acetylene fired face flamed onto the riser face to create natural stone surface suitable for aesthetics.
 - .4 The finished rock step shall be placed and packaged onto a wood palette and be ready for all trucking and hauling work. The new finished rock step shall be completely washed and free of any noxious weed and dirt materials.
 - .5 The size of the new Stone Step unit shall be a cut stone width of 1.2 meters (48 ") in overall length and then shall be cut to a Final Length of 0.6 meters (24") length. This shorter length of stone section is to be used for an easier on-site installation work at the exact step area at the new Switchback location. The unit can be handled by a crew of 4 men to position and fully place the new stone step unit. The exact method of installation is to be determined by the Contractor and paid for at a unit cost per each 0.6-meter-long Stone Step unit. The 0.6-meter-long step shall be used to create a larger landing area at the upper Switchback areas in order to make for easier access and for passing of users on the Trail Route.
- .3 Rock Waterbars
- .1 The rock product is a screened drainage material ranging in gradation from 25mm to 80mm in average cross section. The drainage stone contains voids in aggregate. The Contractor to construct a 150mm depression in the compacted and prepared trail base prior to installation of the new rock waterbars. Install 200mm compacted drainage rock materials at a 30 - 40 degree angle to the trail surface. Rock Waterbars are to extend 1.0m from the edge of the trail to deflect the run-off water from the trail surface. Extend into vegetation a max of 1.0m. The crushed stone materials shall be thoroughly washed to remove any noxious weeds at the pit area prior to any hauling work done to the National Park areas. All trucking and hauling work is part of the Contractor's costs borne within the unit price costs.

2.3 Portland Cement Add-in Materials

- .1 Contractor shall supply Portland Cement in standard bags. Portland Cement to: CAN/CSA -A3000, Type HE- high early strength, Type HS- sulphate resistant.
- .2 Contractor shall supply Portland Cement in standard containers. The Cement materials shall be mixed into the gravel trail materials at a specific rate of additive add in. The cement materials shall be mixed into the gravel materials at a rate of 5% of the total volume of each bag of gravel materials to be flown to the exact job site location on the Bears Hump Trail. This mixture will be reviewed during the construction phase and may be adjusted by the Departmental Representative in order to achieve the exact mixture necessary for the new gravel trail improvements.
- .3 The purpose of the gravel and the cement mixture is to create a stronger base gravel and surface gravel layer within the Bears Hump and Alderson Trail Improvements. Previous construction work did not have this amendment added and it is to be used during this contract work. The mixture will be used in BOTH THE BASE LAYER AND THE SURFACE LAYER.
- .4 The new switchback areas will use this mixture of gravel for the base areas within the existing rocky edges and exposed bedrock switchbacks. The Contractor is required to install a maximum of 200mm (8") lift of base gravel mixture at the switchback locations. The layer is to be completely compacted and rough finished and ready for the additional and final layers of surface gravel fills. This method will be to create a strong and compacted fill section which will be used for the stair tread and the new rock wall structure to be installed at the switchback location.

2.4 Rock Mortar

- .1 There is a need for an industrial cementitious mortar grout cement to be used within the trail construction. Contractor shall provide details of exact mortar grout / cement to the Departmental Representative at the start up meeting. The mortar will be used in the installation of the side rock cobble walls at the new Switchback Areas.

2.5 SOURCE QUALITY CONTROL

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 2 weeks minimum before starting production.
- .2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .3 Advise Departmental Representative 2 weeks minimum in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.
- .5 An acceptable rock supplier is:

RSSS QUARRIES LTD. (www.rsssrocks.com) c/o Mr. Rod Roth- Owner

Office Address: 100 Slater Road NW, Cranbrook BC, Phone: 1- 250-464-9991

Quarry Location Address: Pit #1, Quarry 3.2 km. on the Peavine Main Forestry Cranbrook BC.

- .6 Contractor may or not contact the acceptable Rock Supplier for further information on the rock products, cost of materials and any required hauling from source borrow pit to the Waterton Lakes National Park job location.
- .7 Certification of Weed Free Rock Quarry: The supplier of the new Rock Cut Steps and Rock materials shall provide a certificate of invasive weed free identification of the Rock Quarry by the Provincial Government.
 - .1 All the trucks used in the hauling and supply of any Cut Stone Steps and Rock must be thoroughly cleaned prior to entering into the National Park areas.

Part 3 Execution

3.1 PREPARATION

- .1 Processing
 - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 Blend aggregates, as required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.
 - .1 Use methods and equipment approved in writing by Departmental Representative.
 - .2 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
 - .3 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
 - .1 Use only equipment approved in writing by Departmental Representative.
- .4 Stockpiling:
 - .1 Stockpile aggregates on site.
 - .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 within 48 hours of rejection.
 - .7 Stockpile materials in uniform layers of thickness as follows:

- .1 Maximum 1.5 m for coarse aggregate and base course materials.
- .2 Maximum 1.5 m for fine aggregate and sub-base materials.
- .3 Maximum 1.5 m for other materials.
- .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .9 Do not cone piles or spill material over edges of piles.
- .10 Do not use conveying stackers.
- .11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 – 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 00 - 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.

END OF SECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Work performed under this section will be incidental to work involved in other sections.
- .2 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.

1.2 DEFINITIONS

- .1 Excavation classes: three classes of excavation will be recognized; common excavation, cobble excavation and rock excavation.
 - .1 Rock: solid material in excess of 1.00 m³ and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m³ bucket. Frozen material not classified as rock.
 - .2 Cobble: solid material encountered on-site to be salvaged for re-incorporation
 - .3 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock or cobble 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 Type 3 fill material: material, obtained from onsite 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 D 4318, and gradation within limits specified when tested to ASTM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.

.2 Table:

Sieve Designation	% Passing
2.0 mm	100
0.1 mm	45 – 100
0.02 mm	10 - 80
0.005 mm	0 – 45

.3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 EXISTING CONDITIONS

.1 Buried services:

- .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
- .2 Prior to beginning excavation Work, notify applicable Departmental Representative, establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
- .3 Maintain and protect from damage, utilities and structures encountered.

.2 Existing buildings and surface features:

- .1 Conduct, with Departmental Representative condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks and monuments which may be affected by Work.
- .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair.

Part 2 Products**2.1 MATERIALS**

- .1 Type 3 fill: common excavation of selected material from on-site excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 200mm, cinders, ashes, sods, refuse or other deleterious materials to bring the sub-grade surface to within tolerances.
- .2 Cobble Rock Excavation: rock cobble excavation of selected material from excavation salvaged from on-site sources approved by the Departmental Representative for use intended, unfrozen and free from cinders, ashes, sods, refuse, or other deleterious materials to be incorporated into the rock cobble walls at the switchback areas.

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 requirements of authorities having jurisdiction.
- .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 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Saw cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly in accordance with Section 02 41 13 - Selective Site Demolition.
- .3 Strip topsoil from work areas to the full depth of organic material.

3.3 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 Departmental 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.

3.4 STOCKPILING

- .1 Stockpile fill materials in areas designated by Departmental Representative.
 - .1 Stockpile granular materials in manner to prevent segregation.
 - .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.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

- .1 If required, designs of these temporary works need to be completed by and approved by a Professional Engineer.

- .2 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.
 - .1 Where conditions are unstable, Departmental Representative to verify and advise methods.
- .3 Construct temporary Works to depths, heights and locations as approved by Departmental Representative.
- .4 During backfill operation:
 - .1 Unless otherwise indicated or directed by Departmental Representative, remove sheeting and shoring from excavations.
 - .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
 - .3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.
- .5 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .6 Upon completion of substructure construction:
 - .1 Remove cofferdams, shoring and bracing.
 - .2 Remove excess materials from site and restore watercourses as indicated by Departmental Representative.

3.6 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Departmental Representative's approval 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 in accordance with Section 01 35 43 - Environmental Procedures to approved areas and in a 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.

3.7 EXCAVATION

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as shown on drawings.
- .3 Remove concrete, asphalt, walks and other obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.

- .5 Keep excavated and stockpiled materials safe distance away from edge of trench.
- .6 Restrict vehicle operations directly adjacent to open trenches.
- .7 Dispose of surplus and unsuitable excavated material outside of Waterton Lakes National Park.
- .8 Do not obstruct flow of surface drainage or natural watercourses.
- .9 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .10 Notify Departmental Representative when bottom of excavation is reached.
- .11 Obtain Departmental Representative approval of completed excavation.
- .12 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth.
- .13 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.
- .14 Rocks 0.6m³ up to 1m³ to be salvaged and stockpiled at Upper Compound (approx. 3.5km from site).

3.8 FILL TYPES AND COMPACTION

- .1 Use types of fill as indicated or specified below.
 - .1 Under road pavement, parking areas, sidewalk and other graveled areas, use Type 3 fill material for backfill, compact to 95% of corrected maximum dry density to ASTM D698.
 - .2 Under grass and trails area not subject to vehicular traffic, use Type 3 fill for backfill. Compact to 95% of corrected maximum dry density to ASTM D698.

3.9 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has inspected and approved installations.
- .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 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
 - .2 Place layers simultaneously on both sides of installed Work to equalize loading.

3.10 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects.
- .2 Reinstate grass to elevation which existed before excavation.
- .3 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .4 Clean and reinstate areas affected by Work.
- .5 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures. Products

Part 2 Products

2.1 NOT USED

- .1 Not Used

Part 3 Execution

3.1 RESERVATION OF MATERIAL

- .1 Whenever gravel, sand, topsoil, or any other material suitable for special use is encountered, it shall be deemed to be the property of the Waterton National Park and shall be stockpiled at Upper Compound (approx. 3.5km from site)
- .2 Where layers of gravel or gravelly mixtures are encountered, suitable materials shall be excavated separately from other excavation and shall be stockpiled at Upper Compound (approx. 3.5km from site) or incorporated into the work as base material.

3.2 DISPOSAL OF MATERIAL

- .1 Excavated materials shall be utilized as fill where required on any portion of the work being carried out under this Contract. If designated for reuse, the material may be stockpiled on site or elsewhere in the Park as directed/approved by the Departmental Representative. Where excavated material are not specifically directed to be used as fill or for any other purpose, the Contractor will be required to haul the material as part of his subgrade preparation work to an approved disposal site outside of Waterton Park. There is no separate payment for this work and is considered included in the subgrade preparation unit payment.
- .2 Sufficient material will be kept on site for backfill of curbs and boulevard areas.
- .3 Overhaul will not be paid to haul back to an area which contained a surplus of excavated soil suitable for this purpose.
- .4 The excavated material shall be hauled and dumped at the fill area as part of the unit of subgrade preparation. Any materials required to be used in boulevard areas or for rounding at the base of cuts or fills shall be placed, spread in lifts not exceeding 150 mm, and fine graded as part of the unit of excavation. Compaction of 95% will be required.
- .5 All materials deemed to be in excess of requirements or unsuitable shall be disposed of appropriately by the Contractor outside of Waterton National Park.

3.3 FINISHING AND COMPACTING SUBGRADE

- .1 The excavated sections shall be ploughed to a depth of at least 300 mm below the surface of the subgrade and replaced and compacted to a minimum of ninety five percent (95%) of corrected maximum dry density. The cut shall be left sufficiently high so that the surface after compaction can be trimmed to the final grade, and any loose material resulting from this operation removed. All depressions caused by the finishing rollers shall be removed during the final blading operation.

3.4 EXCAVATION BELOW GRADE

- .1 Unsuitable Materials: When topsoil, muskeg, or other soft areas are encountered below the finished subgrade, which in the opinion of the Departmental Representative require removal, the area shall be undercut and the unsuitable material excavated, loaded and disposed of outside of Waterton National Park. These materials shall be replaced with suitable common excavation.
- .2 Placing Fill: Fill material shall be placed in successive horizontal layers not exceeding 150 mm. Suitable spreading and leveling equipment shall be kept in continuous operation at all times.
- .3 Compaction: The compaction will be sufficient to obtain a minimum density of 95% of corrected maximum dry density in accordance with ASTM D698 (Method C or D), unless otherwise stated in the specifications. Where it is necessary to add or remove moisture from the soil to obtain the compaction, it shall be done as part of the requirements of this section.
- .4 Finishing: The fill section shall be compacted to a level slightly above the finished grade, and cut back to the final elevation. All loose material shall be removed from the surface of the subgrade.

3.5 THE FOLLOWING TESTS SHAL BE EMPLOYED TO ESTABLISH COMPACTION PROCEDURES:

- .1 The corrected maximum dry density of the soil shall be determined by ASTM procedure D-698 (Moisture Density Relationships of soils), to be determined for each soil type. The optimum moisture content of the soil shall be determined from the laboratory compaction curve established.
- .2 The field density of soils shall be determined by ASTM D-2922 – Determining density of soil and soil aggregate in place by nuclear methods (shallow depth).

3.6 NORMAL COMPACTED THICKNESSES OF LIFTS

Equipment Type	Cohesive Soils	Non-Cohesive Soils
Vibratory Sheepfoot Packer	300 mm	300 mm
Sheepfoot Packer	200 mm	-
Pneumatic Tire	200 mm	200 mm
Vibratory Roller	150 mm	300 mm
Pneumatic Tamper (contact area < 130 sq cm)	100 mm	100 mm
Pneumatic Tamper (contact area > 130 sq cm)	100 mm	100 mm

Mechanical Tamper (diesel or gas – jumping jack)	100 mm	200 mm
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- .1 Thickness of lifts for other equipment shall be determined by laboratory testing procedures during the construction process. The Departmental Representative may grant approval in writing to alter lift thicknesses upon evidence of satisfactory compaction at other lift thicknesses.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures. Products

Part 2 Products

2.1 SAMPLES

- .1 At least two (2) weeks prior to commencing work, provide the Departmental
.2 Representative of proposed source of aggregates and provide materials certification of properties below.

2.2 MATERIALS CERTIFICATION

- .1 Aggregates: At least two (2) weeks prior to commencing work provide:
.1 Test data reports representing granular base and/or granular sub-base processed into stockpile. Submit one (1) complete aggregate gradation analysis report for every 1,000 tonnes of each material required for the project or one complete analysis for each production day when production is less than 1,000 tonnes. Include percentage of crushed coarse aggregate particles in granular base reports.
.2 Certification that the physical properties of the aggregates meet the requirements of this section.
.3 Reports and certification shall be provided by an independent testing consultant under the signature and professional seal of a qualified materials engineer.
.2 At least two (2) weeks prior to contemplated change in source of aggregates, provide written notification to the Departmental Representative and provide new materials certification in accordance with the requirements of this section.

2.3 GRANULAR BASE AND SURFACE GRAVEL

- .1 Crushed stone or gravel consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
.2 Physical properties of Aggregates:
% Fracture, by weight (2 faces) 60 min.
Los Angeles Abrasion, loss, % 45 max.
Liquid Limit, % 25 max.
Plasticity Index, % 6 max.
Lightweight Particles, % 5 max.
California Bearing Ratio, when 80 min.
compacted to 100% of ASTM D698 Execution

- .3 Gradation to be within the following limits when tested to ASTM C-117 with sieve sizes to CAN/CGSBD 8-GP-2M rather than ASTM E11, and to have a smooth curve without sharp breaks when plotted on a semi-log grading chart.

- .4 Base Gravel Aggregate shall meet the following:

Sieve Size	Percent Passing by Weight
25 000	100
20 000	82-97
16 000	70-94
10 000	52-79
5 000	35-64
1 250	18-43
630	12-34
315	8-26
160	5-18
80	2-10

- .5 Trail Surface Gravel Aggregate shall meet the following:

Sieve Size	Percent Passing by Weight
9 000	90-100
4 500	70-100
425	40-70
75	8-40

Part 3 Execution

3.1 PREPARATION

- .1 The Contractor shall maintain the subgrade to the specified section, free from ruts, waves and undulations until granular sub-base material is placed. The subgrade shall be in a firm dry condition and must be approved by the Departmental Representative before gravel is placed. The depositing of granular base or sub-base on a soft, muddy or rutted subgrade will not be permitted.

3.2 PLACING

- .1 Place material on a clean unfrozen surface, properly shaped and compacted and free from snow and ice.
- .2 Place using methods which do not lead to segregation or degradation of aggregate. Use approved methods to create uniform windrow of material along a crown line or high side of a one-way slope.
- .3 Place material to full width in layers not exceeding 150 mm in compacted thickness.
- .4 Shape each layer to a smooth contour and compact to the specified density before succeeding layer is placed.
- .5 Remove and replace any portion of a layer in which material becomes segregated during compaction.

3.3 COMPACTING

- .1 Moisture condition of granular base course and surface course materials to be within plus or minus 3 percent of the optimum moisture content of the material.
- .2 Compact to density not less than 95% of corrected maximum dry density in accordance with ASTM D698 (Method C or D).
- .3 Shape and compact alternately to obtain a smooth, even and uniformly compacted base.
- .4 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

3.4 FINISH TOLERANCES

- .1 Finished base and surface gravel shall be within plus or minus 25 mm of established grade, but not uniformly high or low.
- .2 Correct surface irregularities by loosening and adding or removing materials until surface is within the specified tolerances.

3.5 MAINTENANCE

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

3.6 TESTING

- .1 The Departmental Representative may perform quality assurance tests for acceptance in accordance with the requirements of this section. Test data provided shall be final and binding on both the Department and the Contractor.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures

1.2 DEFINITIONS

- .1 End Product Specification (EPS) – A specification whereby the methods of construction are not defined. Under EPS the Departmental Representative 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 responsible for quality control. End product acceptance, including quality acceptance is responsibility of the Departmental Representative.
- .2 Project Category – For the purposes of this specification, projects are to be identified as Category A or Category B. Generally, Category A projects have asphalt concrete quantities greater than 2,000 tonnes of any one mix type; and Category B projects have quantities of any one mix type less than 2,000 tonnes.
- .3 Lot – A lot is a portion of the Work being considered for acceptance, and is defined as the following:
 - .1 Category B projects – The entire project quantity for each mix type.
 - .2 At the Departmental Representative's discretion, any portion of the Work may be deemed a lot.

Part 2 Products

2.1 MATERIALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C, 4 weeks prior to beginning Work.
- .2 Samples:
 - .1 Inform Consultant of proposed source of aggregates and provide access for sampling 4 weeks prior to beginning Work.

2.2 MIX DESIGN

- .1 An asphalt mix design must be prepared and submitted to the Departmental Representative for review and approval at least one week prior to the work. The Contractor shall use qualified engineering and testing services licensed to practice in the Province of Alberta.

- .2 The mix design shall follow the Marshall method of mix design as outlined in the latest edition of the Asphalt Institute Manual Series No. 2 (MS-2), and shall include five separate trial values of asphalt content.
- .3 Design of mix:
 - .1 Mix Type III – 75 blows on each face of test specimens.
- .4 Include the following data with mix design submission
 - .1 Aggregate specific gravity and asphalt absorption.
 - .2 Sand equivalent, coarse aggregate fracture, flat and elongated particles, and percent manufactured sand values.
 - .3 Asphalt cement supplier/refinery, specific gravity and mixing and compaction temperatures, based on temperature-viscosity properties of asphalt cement.
 - .4 Job mix formula including aggregate gradation and blending proportions, and design asphalt content.
 - .5 Maximum relative density at each trial asphalt content.
 - .6 Where reclaimed asphalt pavement (RAP) is to be incorporated into the mix supply, RAP gradation, RAP asphalt cement content and design recycle percentage.
 - .7 Data to satisfy the requirements of the following:

Table 2.2.4.7
Mixture Physical Property Requirements

AGGREGATE PASSING SIEVE SIZE (µm)	TOLERANCE (% BY MASS)		
PROPERTY	REQUIREMENTS		
	Mix Type		
		III	
Marshall Stability (kN)		5.4 min.	
Marshall Flow (0.25 mm units)		8 – 14	
Air Voids (%)		2.8 – 3.2	
Voids in Mineral Aggregate (VMA) (%)		14.0 – 16.0	
Voids Filled With Asphalt (VFA) (%)		70 – 80	
Film Thickness (µm)		7.0 min.	

2.3 JOB MIX FORMULA

- .1 Subject to approval by the Departmental Representative, the aggregate proportioning (including RAP), target gradation, asphalt content and air void content from the Mix Design will become the Job Mix Formula for the supply of hot mix asphalt.
- .2 Once established, no alterations to the Job Mix Formula will be permitted unless the Contractor submits a new Job Mix Formula and approved by the Departmental Representative.
- .3 If the sum of any alterations to the Job Mix Formula is in excess of any one of the following limits, a new Mix Design is required.
 - ± 5% passing the 5 000 µm sieve size
 - ± 1% passing the 80µm sieve size
 - ± 0.30% asphalt content
- .4 Any alteration to the Job Mix Formula shall not result in properties which do not meet the requirements of this Specification.

2.4 PRODUCTION TOLERANCES

- .1 All mixtures shall be supplied to the Job Mix Formula within the range of tolerances specified.
- .2 Asphalt cement content: ± 0.30% of JMF value.
- .3 Temperature: Mix temperature at point of plant discharge shall not vary from that specified in the JMF by more than ± 10°C.
- .4 Aggregate Gradation:

Max. Size to 5 000	± 5.0
2 500 & 1 250	± 4.0
630 & 315	± 3.0
160	± 2.0
80	± 1.0
- .5 Air Voids: ± 1.0 % of the JMF value.
- .6 Mixture Properties: Marshall Stability, Marshall Flow, Voids Filled with Asphalt, Voids in Mineral Aggregate, and Film Thickness as per requirements identified in Table 2.2.4.7.
- .7 Moisture in Mix: Maximum permissible moisture, at point of plant discharge, is 0.2% by mass of mix.
- .8 Asphalt cement recovered from freshly produced hot mix by the Abson Method, ASTM D1856 and subsequently tested in accordance with ASTM D5, shall retain a minimum value of 50% of its original penetration value.

Part 3 Sampling and Testing

3.1 GENERAL

- .1 The Departmental Representative shall have access to all production processes and materials used for the work to monitor material quantity as often as deemed necessary. Such inspection and testing shall not relieve the Contractor of the responsibility for meeting the requirements of this specification.
- .2 At least three (3) weeks prior to commencing work, inform the Departmental Representative of the proposed source of aggregates and provide access for sampling, and provide samples of asphalt cement.

3.2 QUALITY CONTROL

- .1 Quality control is the responsibility of the Contractor throughout every stage of the work from aggregate processing to the final accepted product. Tests performed by the Departmental Representative will not be considered as quality control tests.
- .2 The Contractor shall be totally responsible for production of materials and construction that meets all specified requirements.
- .3 All quality control shall be conducted by qualified personnel. The Contractor shall bear the cost of all quality control testing and consulting services.
- .4 Post-Production Quality Control test data shall be reported to the Departmental Representative daily as the work proceeds.

3.3 ACCEPTANCE SAMPLING AND TESTING

- .1 Within this specification, certain requirements, limits and tolerances are specified regarding supplied materials and workmanship. Compliance with these requirements shall be determined from acceptance testing as described in this section.
- .2 Acceptance testing is the responsibility of the Departmental Representative.
- .3 Sampling and acceptance testing is described in Table 3.4.4, Acceptance Testing Requirements – Category A & B Projects.

Table 3.4.4
Acceptance Testing Requirements – Category A & B Projects

Acceptance Testing	Test Standard	Minimum Frequency
Hot Mix Asphalt Analysis (including Binder Content, Aggregate Gradation, Marshall Density, Maximum Relative Density, Void Properties, Marshall Stability and Flow)	ASTM D 6307 ASTM C 117 ASTM C 136 ASTM D 2041 ASTM D 3203	For each mix type, one test for each 3,500 sq.m. of placement, or three tests per lot, whichever is greater. See note 1.

Compaction Testing (Core Density) and Thickness Determination	ASTM D 2726 ASTM D 3549	For each mix type, one test for each 2,000 sq.m. of placement, or three tests per lot, whichever is greater.
Hot Mix Asphalt Temperature	-	No minimum frequency.

Note 1: For Category B projects, the Departmental Representative may, at their discretion, acquire the minimum number of mix samples, but reduce the number of tests to a minimum of one (1). Should non-compliance be indicated by the sample(s) tested, the Departmental Representative reserves the option to test the remaining samples.

.4 Acceptance Sampling Procedures:

- .1 Loose mix samples shall be acquired from the Work site in accordance with Albert Transportation Test (ATT) procedure ATT-37. Auger samples may be used if approved by both the Departmental Representative and the Contractor.
- .2 The timing of mix sampling shall be stratified, with each sample representing a similar production quantity.
- .3 Core locations will be selected using stratified random sampling procedures. The lot will be divided into segments meeting or exceeding the minimum frequency in Table 3.4.4 and of approximately equal area. In each segment a test site will be located using random numbers to determine the longitudinal and transverse coordinates.

.5 Reporting Protocols

- .1 Test reporting accuracy shall be as stipulated in the referenced test procedures, including:
 - .1 Gradation to the nearest whole number, except the percent passing the 80 μ m sieve, which shall be reported to the nearest 0.1%.
 - .2 Binder content to the nearest 0.01%.
 - .3 Air voids and compaction to the nearest 0.1%.
 - .4 Thickness to the nearest whole millimeter (mm).
- .2 Lot averages shall be reported to the same accuracy as test results.

Part 4 Execution

4.1 MIX PRODUCTION

- .1 Preparation of Mineral Aggregate
 - .1 The Mineral aggregates shall be at as low a temperature as is consistent with proper mixing and lay down and in no case to exceed 165°C.
- .2 Composition of Mixture

- .1 The mineral aggregate, reclaimed asphalt pavement (where applicable) and asphalt cement shall be mixed in a manner to produce a homogeneous mixture in which all particles of the mineral aggregate are uniformly coated.
- .2 Incorporate RAP such that it does not come in direct contact with the burner flame.
- .3 Plant emissions shall not exceed the limits set by Alberta Environment.

4.2 PREPARATION FOR PAVING

- .1 The Contractor shall provide the Departmental Representative a minimum of six hours notice of the intention to commence paving over any previously approved primed or tacked surface.
- .2 The hot asphalt mixture shall be laid upon a dry firm surface, true to grade and crosssection and free from all loose or foreign material. No hot mix shall be placed when the surface is wet or when other conditions prevent proper spreading, finishing or compaction.
- .3 If undercutting, and subsequent backfill with asphalt concrete is done, the backfill operation shall be performed sufficiently far ahead of the paving operation to allow the asphalt concrete time to cool down enough to support equipment.

4.3 HOT MIX ASPHALT PLACING TEMPERATURE

- .1 No hot mix asphalt shall be dispatched to the field unless the temperature, as issued by Environment Canada, is rising and meets the following minimum temperature requirements.
 - .1 Thickness less than 50 mm: 7°C
 - .2 Thickness greater than 50 mm: 2°C
- .2 A tolerance will be permitted for plant start-up.
- .3 No surface lift asphalt shall be placed regardless of temperature until the road surface is 5°C or higher.

4.4 HOURS OF OPERATION

- .1 No loads of hot mix asphalt shall be dispatched from the plant after sunset or during hours of darkness unless loads can be placed and compacted in accordance with these specifications, and suitable artificial illumination is provided, all subject to the Departmental Representative's approval.

4.5 TRANSPORTATION OF HOT MIX ASPHALT

- .1 Trucks shall be equipped with tarpaulins of sufficient weights and size to cover the entire open area of the truck box. Regardless of weather conditions, tarpaulins shall be used.
- .2 Vehicles used for the transportation of hot mix asphalt from the plant to the site of work shall have tight metal boxes previously cleaned of all foreign matter. The inside surface may be lightly lubricated with a soap solution just before loading. Excess lubrication will not be permitted.

- .3 For purposes of checking asphalt mixture temperatures, trucks shall have an accessible 13 mm diameter hole drilled into the driver's side of the truck box, at a distance of 0.3 metres from the bottom of the box and 150 mm clear of the reinforcing ribs.
- .4 The speed and weight of hauling trucks shall be regulated so that, in the opinion of the Departmental Representative, no damage will occur to any portion of the work underway. The Contractor at their own expense shall repair any damage to the tack coat, prime coat or the existing surface caused by the Contractor's equipment.

4.6 HOT MIX ASPHALT SPREADERS

- .1 The spreading machine shall be self-propelled and capable of placing a uniform layer of asphalt mix to the depth and grades as shown on the plans or as indicated by the Departmental Representative.
- .2 The screed shall include a tamping bar or vibratory strike-off device for use when required. The screed shall strike-off the mix to the depth and cross-section specified and produces a finished surface of uniform texture.
- .3 Control of the screed shall be by automatic sensing devices. Longitudinal control shall be accomplished by a sensor, which follows a string line, ski, or other reference. The grade sensor shall be movable and mounts provided so that grade control can be established on either side of the paver. A slope control sensor shall also be provided to maintain the proper transverse slope of the screed. Use automatic grade control for paving operations.

4.7 HAND TOOLS

- .1 Only lutes shall be used during the spreading operation and when the asphalt is worked by hand in areas in which the paver cannot reach.
- .2 Tamping irons may be used to consolidate the material along structures inaccessible to the rollers. Mechanical compaction equipment, satisfactory to the Departmental Representative, may be used instead of tamping irons.
- .3 For purposes of checking the finished surface, the Contractor must provide and carry on each paving machine a 3 metre straight edge and slope measuring level.

4.8 PRE-LEVELLING FOR ASPHALT CONCRETE

- .1 Pre-levelling of uneven surfaces over which asphalt concrete is to be placed shall be accomplished by the use of asphalt concrete placed with a grader, paver, hand or by a combination of these methods.
- .2 After placement, the asphalt concrete used for pre-levelling shall be compacted thoroughly with pneumatic tired rollers.

4.9 PAVING OPERATIONS

- .1 The asphalt concrete shall be placed to the design thickness as shown on the contract drawings. On new construction where an established reference is lacking, a string-line reference will be required. Adjacent mats on the same lift are to be controlled by use of the grade sensor. No relaxation of the above procedure will be permitted without written approval of the Departmental Representative.

- .2 The spreader shall be operated in such a manner as to distribute the asphalt concrete mix to proper cross section, width and thickness without causing segregation of the mix. Segregated areas, which may occur, shall be corrected immediately. The forward motion of the spreader shall be controlled so that no irregularities in the pavement surface are caused by excessive speed. The rate of placement of the mixture shall be uniform, and shall be co-ordinated with the production rate of the asphalt plant without intermittent operation of the spreader.
- .3 Any failure of the machine or operation to produce a smooth, uniformly dense mat, free from irregularities, shall be corrected immediately to the satisfaction of the Departmental Representative.

4.10 AREAS INACCESSIBLE TO THE PAVING MACHINE

- .1 Areas that are inaccessible to the paving machine may be paved by other methods, as approved by the Departmental Representative.
- .2 In small areas or where the use of mechanical equipment is not practical, the mix may be spread and finished by hand. The asphalt mixture shall be dumped on the area and immediately thereafter distributed into place by shovels and spread with lutes in a loose uniform layer uniform density and correct depth. Material must be handled so as to avoid segregation.

4.11 COMPACTION

- .1 The Contractor shall supply sufficient compaction equipment to:
 - .1 Provide a compaction rate that will equal or exceed the placing rate of the spreader.
 - .2 Ensure the specified compaction is attained before the temperature of the mat falls below 80°C.

4.12 LONGITUDINAL AND TRANSVERSE JOINTS

- .1 Longitudinal and transverse joints shall be made in a manner consistent with industry standards. Coarse aggregate removed from the hot mix during joint preparation shall not be broadcast onto the mat.
- .2 Paving joints shall not be placed in the same vertical plane. Longitudinal joints shall be offset at least 150 mm and transverse joints shall be offset at least 2 metres.
- .3 Longitudinal joints shall not be located within travel lanes, unless approved by the Departmental Representative.
- .4 Edges where additional pavement is to be placed shall be vertically formed to true line. A lute shall be used immediately behind the paver when required to obtain a true line and vertical edge.
- .5 The exposed edges of all cold asphalt joints and the face of concrete
- .6 At the end of each day's paving of the surface course and upper lift of the base course mix, the uncompleted paving mats shall be provided with vertically cut transverse joints. Joints between old and new pavements or between successive days' work shall be carefully made in such a manner as to ensure a thorough and continuous bond between the old and new surfaces.

4.13 OPENING TO TRAFFIC

- .1 Prior to any application of traffic, paving mats shall be sufficiently cool to resist and deformation or surface scuffing.
- .2 The Departmental Representative may, at their discretion, require means of cooling (e.g. application of water) completed pavements prior to opening to traffic.
- .3 At their discretion, the Departmental Representative may prohibit traffic from travelling on newly paved surfaces for any length of time deemed necessary.

Part 5 Quality Control

5.1 QUALITY CONTROL

- .1 The Contractor shall provide an end product conforming to the quantity and tolerance requirements of this specification. Where no tolerances are specified, the standard of workmanship shall be in accordance with accepted industry standards.
- .2 Acceptance of any Lot at full or increased payment will occur if there are no obvious defects and the Lot mean results for asphalt content, pavement density, and thickness meet or exceed the specified tolerances.

5.2 PAVEMENT COMPACTION FOR MACHINE PLACED ASPHALT

- .1 For full or increased payment, the Lot Mean Pavement Compaction must be equal to or greater than 93% of the Lot Mean Maximum Relative Density.
- .2 Payment adjustment for pavement compaction is as follows:

Pavement Compaction % of Maximum Relative Density	Payment Adjustment Factor
94.6 to 95.5 (Note 1)	1.03
93.5 to 94.5 (Note 1)	1.02
93.0 to 93.4	1.00
90.0 to 92.9	As per Chart B
Less than 90.0	Reject (Note 2)

Note 1: Where no individual test result is less than 93% otherwise the payment adjustment factor 1.00.

Note 2: Subject to removal and replacement at the discretion of the Departmental Representative.

5.3 THICKNESS (NEW CONSTRUCTION AND TOP LIFT ONLY)

- .1 Pavement of any type found to be deficient in thickness by more than 7.0 mm shall be removed and replaced by pavement of specified thickness, at the Contractor's expense.
- .2 The Lot Mean Thickness for any Lot will be determined on the basis of the acceptance cores described in Table 3.4.4. Core thickness shall be determined in accordance with ASTM D 3549.
- .3 If the deficiency of any individual core exceeds 7 mm, additional cores may be extracted in the proximity to the location of the core of excessive deficiency, to identify the extremities of the pavement area subject to be removed and replaced. The Contractor shall pay for such additional coring.
- .4 For full payment, the Lot Mean Thickness must be equal to, or greater than, the specified thickness.
- .5 Payment adjustment for the thickness is as follows:

Average Thickness Compared to Specified Thickness	Payment Adjustment Factor (Note 1)	
	Total Thickness (Single or Multiple Lifts)	Top Lift Thickness (Multiple Lifts)
Compliant or Greater	1.00	1.00
More than 7 mm Deficient	Reject (Note 1)	Reject (Note 1)

Note 1: Subject to removal and replacement at the discretion of the Departmental Representative.

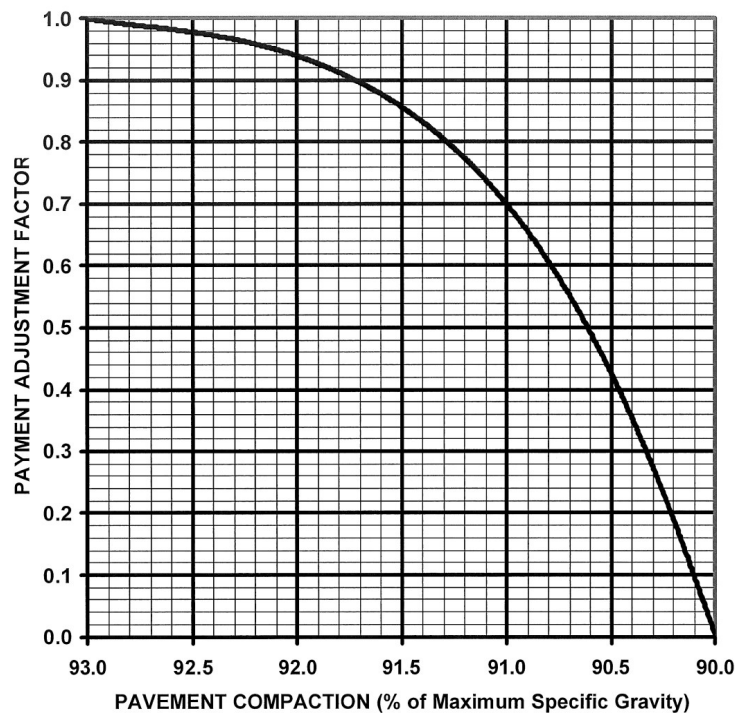
5.4 SEGREGATION

- .1 The finished surface shall have a uniform texture and be free of segregated areas. A segregated area is defined as an area of the pavement where the texture differs visually from the texture of the surrounding pavement.
- .2 All segregation will be evaluated by the Departmental Representative to determine repair requirements.
- .3 The severity of segregation will be rated as follows:
 - .1 Slight: The matrix of asphalt cement and fine aggregates is in place between the coarse aggregate particles, however there is more stone in comparison to the surrounding acceptable mix.
 - .2 Moderate: Significantly more stone than the surrounding mix, and 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 Segregated areas shall be repaired by the Contractor. The following methods of repair are identified.

- .1 Slight: Squeegee asphalt to completely fill the surface voids.
- .2 Moderate: Slurry seal for full mat width.
- .3 Severe: Removal and replacement or overlay.
- .5 All repairs shall be regular in shape and finished using good workmanship practices to provide an appearance suitable to the Departmental Representative.
- .6 Any other methods of repair proposed by the Contractor will be subject to the approval of the Departmental Representative.
- .7 Repairs will be carried out by the Contractor at their expense.

5.5 COMPACTION PAYMENT ADJUSTMENT FACTOR FOR MACHINE PLACED ASPHALT

CHART B
COMPACTION
PAYMENT ADJUSTMENT FACTOR



Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM C131- 06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .2 ASTM C136- 06, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM C171- 03, Standard Specification for Sheet Materials for Curing Concrete.
- .4 ASTM D558- 04, Standard Test Methods for Moisture-Density (Unit Weight) Relations of Soil-Cement Mixtures.
- .5 ASTM D559- 03, Standard Test Methods for Wetting-and-Drying Compacted Soil-Cement Mixtures.
- .6 ASTM D560- 03, Standard Test Methods for Freezing and Thawing Compacted Soil-Cement Mixtures.
- .7 ASTM D698- 00a1, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
- .8 ASTM D1557- 02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).
- .9 ASTM D4318- 05, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .10 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1- 88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2- M88, Sieves, Testing, Woven Wire, Metric.
- .11 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000- 03 (R2006), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001- 03, Cementitious Materials for Use in Concrete.
 - .2 CAN/CSA-A23.1- 04 /A23.2- 04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .12 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:

- .1 Submit representative samples of aggregates.
- .2 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 2 weeks prior to beginning production.
- .4 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
 - .1 Test reports: submit at least 4 weeks prior to beginning work with copies of manufacturer's test data and certification that cement delivered to job site meets requirements of this Section.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.3 QUALITY ASSURANCE

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning on-site installation, with Departmental Representative in accordance with Section 01 32 16 - Construction Progress Schedule:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review installation instructions and warranty requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Protection:
 - .1 Store aggregates to minimize segregation and contamination in accordance with Section 31 05 16 - Aggregate Materials.
 - .2 Store aggregates on surfaces covered with tightly laid wooden planks, sheet metal, or other hard and clean material, to prevent inclusion of contaminants.
 - .3 Store aggregates of different sizes in separate piles.
 - .4 Form stockpiles of coarse aggregates by spreading materials in horizontal layers not exceeding 1.5 metres in depth.
 - .5 Stockpiling: single-core type, cast and spread type or truck-dumped type. Re-mix segregated coarse aggregates, re-mix stockpile to conform to specified grading requirements.
 - .6 Drain aggregate obtained from below existing water table before use.
 - .7 Store cement immediately upon receipt.
 - .8 Store cement in bags on pallets in airtight and weatherproof structure.
 - .9 Elevate pallets above surface to prevent absorption of moisture.
 - .10 Stack bags close together to reduce circulation of air.

- .11 Do not stack against outside walls.
- .12 Ensure storage method permits easy access for inspection and identification of each shipment.
- .13 Transfer bulk cement to elevated airtight and weatherproof bins. Ensure cement is free flowing and free of lumps.
- .14 Test cement that has been in storage longer than 6 months by standard mortar tests or loss on ignition test and use such cement only with approval of Departmental Representative.
- .15 Show date of receipt of shipment on each bag of cement.
- .16 Deliver curing materials in original sealed containers showing trade name, specification number and manufacturer's name.
- .17 Store to prevent damage and contamination.
- .3 Waste Management and Disposal:
 - .1 Separate waste materials for recycling or reuse in accordance with Section 01 74 19 - Waste Management and Disposal.

1.5 AMBIENT CONDITIONS

- .1 Suspend operations when air temperature is less than 5 degrees C or when rain is forecast within 2 hours.

Part 2 Products

2.1 MATERIALS

- .1 Cement: to CAN/CSA-A3001, Type GU.
- .2 Aggregate: in accordance with Section 31 05 16 - Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradation to be within the following limits when tested to ASTM C-117 with sieve sizes to CAN/CGSBD 8-GP-2M rather than ASTM E11, and to have a smooth curve without sharp breaks when plotted on a semi-log grading chart.
- .3 Water:
 - .1 Provide potable, clean, fresh and free from injurious amounts of oils, acid, salt, alkali, organic matter and other substances deleterious to the hardening of soil-cement.
 - .2 Test water of questionable quality in accordance with CAN/CSA-A23.1/A23.2, as directed by Departmental Representative.

2.2 MIXES

- .1 Minimum cement content: 5 % by mass of dry aggregate.
- .2 Minimum compressive strength: 2.0 MPa at 7 days.
- .3 Proportion aggregates, cement and water to produce mix meeting following physical requirements or as directed by Departmental Representative:

- .1 Percentage of loss not to exceed 14 % when tested by wetting and drying test to ASTM D559.
- .2 Percentage of loss not to exceed 14 % when tested by freezing and thawing test to ASTM D560.
- .3 Test specimen for ASTM D559 and ASTM D560, to be prepared in accordance with method outlined in ASTM D558 except compactive effort to be in accordance with ASTM D1557.
- .4 Mix design formula subject to approval of Departmental Representative.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 SITE PREPARATION

- .1 Clean debris from area to be stabilized.
- .2 Inspect subgrade for capability, to withstand without displacement compaction specified for aggregate-cement mixture.
- .3 Correct ruts, soft or yielding areas in subgrade by removing or adding material or aerating or wetting materials as required.
- .4 Clear and grub, grade and shape area to be stabilized; conform to lines, grades, and cross sections prior to placing cement-treated course.
- .5 Surface: approved by Departmental Representative prior to base course placement.
- .6 Determine moisture-density relationship of existing soils in accordance with ASTM D1557.
- .7 Perform laboratory tests on existing materials prior to initial construction.
- .8 Maintain lines and grades as indicated.
 - .1 When stabilized course is part of pavement which is to meet fixed grade, construct transition long enough to minimize abrupt or noticeable grade changes.

3.3 SEQUENCE OF OPERATION

- .1 Mixed-in-place:
 - .1 Ensure no frozen materials are used in mixing.
 - .2 Travelling mixing machine to have following features:
 - .1 Capable of picking up aggregate and cement off grade for dry mixing.
 - .2 Equipped with spray nozzle type of watering system.
 - .3 Capable of spreading mix in uniform layers.
 - .3 Begin placement at crown or high side of one way design slope.

- .4 Spread base aggregate to required depth or place in windrow as required by type of mixing machine used.
- .5 Spread cement on aggregate by approved self-powered mechanical cement spreader at rate approved by Departmental Representative.
- .6 Pick up and mix dry cement and aggregate until homogeneous.
 - .1 Add water and remix until water is evenly distributed.
- .7 Spread and compact mix in uniform layer of 150 mm (minimum) compacted thickness.
- .2 Joints:
 - .1 When placing mix against stabilized base less than 30 min in place, no special jointing required.
 - .2 When placing mix against stabilized base more than 30 min in place, prepare construction joint by cutting back existing material as necessary to expose uniform aligned full depth vertical face, composed of well compacted material.
 - .1 Cutting back is not necessary if form is used.
 - .3 Offset joints at least 250 mm from design joint locations of overlaying pavement.
 - .4 Compact new material against joints to ensure bond.
- .3 Compacting:
 - .1 Compaction equipment: capable of obtaining required material densities.
 - .2 Compact stabilized base to at least 95 % of corrected maximum dry density ASTM D698.
 - .3 Begin compaction immediately after spreading to complete surface finishing within 2 hour from start of mixing.
 - .4 Begin compaction with roller covering outer edge of material and proceed continuously back and forth across area until specified compaction is obtained.
 - .1 Space successive roller passes no more than 75% of width of rear roller wheel is on uncompacted material.
 - .5 Operate compaction equipment forward and backward without turning around.
 - .6 Keep stabilized base surface moist during compaction operation.
 - .7 Complete final compaction using pneumatic tired rollers.
 - .8 Correct high areas by scarifying and removing material until surface is within specified tolerance.
 - .9 Dispose of excess material.
 - .1 Do not use excess material to fill depressions.
 - .10 Correct low areas by adding materials, scarifying, removing, and wasting at least 50 mm of compacted base before bringing to grade with new material.
 - .11 Compact corrected areas.

3.4 SITE TOLERANCES

- .1 Finish cement stabilized granular base to plus or minus 25 mm of design grade and cross section, but not uniformly high or low.

3.5 FINISHING

- .1 Moisten surface, after compaction and shape to required lines, grades and cross section.
- .2 Lightly scarify surface to eliminate imprints made by compacting or shaping equipment.
- .3 Compact surface to specified density with equipment suitable for use on the trail site, rubber tired rollers and smooth-wheel tandem rollers to provide smooth, dense, uniform surface free of surface checking, ridges or loose material and conforming to crown, grade and line indicated.
- .4 Complete finishing operations within 2 hours after completion of mixing operations.
- .5 In places not accessible to finishing and shaping equipment, compact mixture with mechanical tampers to density specified; shape and finish by hand methods.
- .6 Reprocess with additional cement that portion of compacted mix with density less than that specified or that has not properly hardened or that is improperly finished.
- .7 Place material along edges of stabilized course in quantity that will compact to thickness of course being constructed.
- .8 If constructed in two or more layers, place in quantity that will compact to thickness of each layer.
- .9 Where average measured thickness of stabilized course is more than 25 mm deficient in thickness, conduct additional tests and correct deficiencies as directed by Departmental Representative.
 - .1 Correct excesses in thickness if so directed by Departmental Representative.
 - .2 Replace material removed for test holes or for deficient thickness reconstruction and compact with new soil-cement mixture.
 - .3 At end of each work day, form straight transverse construction joint by cutting back into completed work to form true vertical face free of loose or shattered material.
 - .4 Remove improperly compacted material along construction joints and replace with soil-cement that is mixed, moistened, and compacted.

3.6 CURING

- .1 Immediately after completion of finishing operations, but no later than end of each days stabilization work, protect surface against rapid drying for 7 days.
- .2 Immediately after finishing, clean surface of loose and foreign matter.
- .3 Moisten material initially and keep moistened throughout curing period.

3.7 PROTECTION

- .1 Protect cement stabilized base from frost for 7 days after placement.
- .2 Keep vehicular traffic off cement stabilized base, except essential construction traffic.
- .3 Maintain in acceptable condition until succeeding material is applied or until acceptance by Departmental Representative. If rutting occurs, restore to smooth compacted surface.

3.8 CLEANING

- .1 Proceed in accordance with Section 01 74 00 - 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 MEASUREMENT PROCEDURES

- .1 Asphalt prime will not be measured for payment. It is considered incidental to asphalt paving.

1.2 SAMPLES

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.
- .2 Submit two -1 L samples of asphalt prime proposed for use in clean, air tight sealed, wide mouth, plastic lined cans, to Departmental Representative, at least 2 weeks prior to commencing work.
- .3 Submit sample asphalt prime coat materials in accordance with ASTM D 140.

1.3 QUALITY ASSURANCE

- .1 Upon request from Departmental Representative, submit manufacturer's test data and certification that asphalt prime material meets requirements of this section.

Part 2 Products

2.1 MATERIAL

- .1 Asphalt material: 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

Part 3 Execution

3.1 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.

3.2 APPLICATION

- .1 Obtain Departmental Representative approval of granular base surface before applying asphalt prime.
 - .1 Apply asphalt prime to granular base at rate not to exceed 2 L/m².
 - .2 Apply on dry surface unless otherwise directed by Departmental Representative.
 - .3 Apply only on unfrozen surface.
- .2 Do not apply prime when air temperature is less than 10 °C or when rain is forecast within 2 hours.
- .3 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt prime material.
- .4 Prevent overlap at junction of applications.
- .5 Do not prime surfaces that will be visible when paving is complete.
- .6 Apply additional material to areas not sufficiently covered as directed by Departmental Representative.
- .7 Keep traffic off primed areas until asphalt prime has cured.
- .8 Permit prime to cure before placing asphalt paving.

3.3 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 as directed departmental Representative.
- .3 Apply second application of sand blotter as required.
- .4 Sweep and remove excess blotter material.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Inform Departmental Representative of proposed source of materials and provide access for sampling at least 2 weeks prior to commencing work.
- .3 If materials have been tested by accredited testing within previous 2 months and have passed tests equal to requirements of this specification, submit test certificates from testing laboratory showing suitability of materials for this project.

Part 2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .2 Granular base: material to Section 31 05 16 - Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradations: within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1.
- .3 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water-soluble soap.
- .4 Fill material: to Section 31 05 16 - Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradations: within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1.

Part 3 Execution

3.1 GRADE PREPARATION

- .1 Do grade preparation work in accordance with Section 31 23 33 - Excavating, Trenching and Backfilling.
- .2 Construct embankments using excavated material free from organic matter or other objectionable materials.
 - .1 Dispose of surplus and unsuitable excavated material outside of Waterton Lakes National Park.
- .3 Place fill in maximum 150 mm layers and compact to at least 95% of corrected maximum dry density to ASTM D 698.

3.2 GRANULAR BASE

- .1 Obtain Departmental Representative's approval of subgrade before placing granular base.
- .2 Place granular base material to lines, widths, and depths as indicated.
- .3 Compact granular base in maximum 150 mm layers to at least 95% of corrected maximum density to ASTM D 698.

3.3 CONCRETE

- .1 Obtain Departmental Representative's approval of granular base prior to placing concrete.
- .2 Do concrete work in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.
- .4 Provide edging as indicated with 10 mm radius edging tool.
- .5 Hand finish surfaces when directed by Departmental Representative.

3.4 TOLERANCES

- .1 Finish surfaces to within 3 mm in 3 m as measured with 3 m straightedge placed on surface.

3.5 EXPANSION AND CONTRACTION JOINTS

- .1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals shown on the drawings.
- .2 Install expansion joints.
- .3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

3.6 ISOLATION JOINTS

- .1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.
- .2 Install joint filler in isolation joints in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .3 Seal isolation joints with sealant.

3.7 CURING

- .1 Cure concrete by adding moisture continuously in accordance with CSA-A23.1/A23.2 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound.
- .2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.
- .3 Apply curing compound evenly to form continuous film, in accordance with manufacturer's requirements.

3.8 BACKFILL

- .1 Allow concrete to cure for 7 days prior to backfilling.
- .2 Backfill to designated elevations with material as shown on the drawings
 - .1 Compact and shape to required contours.

3.9 CLEANING

- .1 Proceed in accordance with Section 01 74 00 – 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 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Submit manufacturer's instructions, printed product literature and data sheets for concrete mixes, fences, posts and gates and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Wood Certification: submit manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.

1.2 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations.
 - .2 Store and protect fence materials from damage.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Grading:
 - .1 Level ground along fence line prior to reinstallation.

3.3 ERECTION OF FENCE

- .1 Erect fence along lines as directed by Departmental Representative.
- .2 Installation of posts:

- .1 Space posts as shown on the drawings and as directed by Departmental Representative.
- .2 Install posts true to line and plumb.
- .3 Complete foundation around posts as indicated on drawings.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 – Cleaning.
 - .1 Leave Work area clean at end of each day.

END OF SECTION

Part 1 General

1.1 NOT USED

Part 2 Not Used

2.1 NOT USED

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .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 Begin topsoil stripping of areas as indicated and remove to stockpile location within Waterton Lakes National Park at Upper Compound (approx.3.5 km from Site).
- .2 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile height not to exceed 2 m.
- .4 Protect stockpiles from contamination and compaction.
- .5 Stripped sod shall be broken into 2 in or smaller pieces and mixed with the topsoil.
- .6 The contractor shall import topsoil to mix with stockpiled salvaged topsoil at the Upper Compound at a ratio of 1:2. The supplier source of the imported topsoil must be approved by the Departmental Representative prior to import into Waterton Park.

3.3 PREPARATION OF EXISTING GRADE

- .1 Verify that grades are correct.
 - .1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
 - .1 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
 - .2 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.

- .3 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
- .4 Remove debris which protrudes more than 75 mm above surface.
- .5 Dispose of removed material off site.

3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after Departmental Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 100 mm.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil to following minimum depths after settlement.
 - .1 100 mm for seeded areas.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 FINISH GRADING

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

3.6 ACCEPTANCE

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

3.7 SURPLUS MATERIAL

- .1 Dispose of materials, except topsoil not required, outside of Waterton Lakes National Park at an approved dumping facility.

3.8 CLEANING

- .1 Proceed in accordance with Section 01 74 00 – Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 GENERAL

- .1 This specification covers preparation of the area to be seeded, the supply and application of seed and fertilizer, and the finishing of seeded areas.
- .2 Areas to be seeded shall include any disturbed or exposed earth surfaces within the limits of construction shown on the drawings. Any disturbed areas outside of these limits will be seeded at the Contractor's expense.

Part 2 Products

2.1 SUPPLY OF MATERIAL

- .1 Materials for seeding, including grass seed mix, fertilizer, mulch and water shall be supplied by the Contractor.
- .2 Seed and fertilizer materials shall be stored dry and protected from direct sunlight and other detrimental conditions. Materials that have been subjected to detrimental conditions, as determined by Departmental Representative, will not be accepted for use on the project.

2.2 GRASS SEED

- .1 Grass seed shall meet the minimum requirements for Common No. 1 Seed as defined by the Grade Tables under the Canada Seeds Act & Regulations, and shall be of the following composition:

Common Name	Percentage by Dry Weight
Creeping Red Fescue	40%
Perennial Ryegrass	20%
Kentucky Bluegrass	40%

- .2 The seed shall be mixed by a conditioner and bulk storage facility approved by the Authority responsible for Canada Seeds Act & Regulations. All seed shall be tested by a Registered Seed Lab, and each bag shall be clearly marked with the name of the supplier and the mixture composition.

- .3 Prior to the use on the project, the Contractor shall provide the Departmental Representative with a Certificate of Analysis for each lot of seed supplied. Test results from the Certificate of Seed Analysis shall specify the germination, or for native seeds that are not a part of the seed tables the Tetrazolium, and purity for each seed species of the mix as well as the seed mix composition expressed as a percentage of each seed species by dry mass for each seed mix specified.

2.3 HYDRO-MULCH

- .1 Mulch material shall be cellulose fibre unless otherwise specified in the Special Provisions. Mulch shall be clean and free of weeds and other foreign matter. Mulch shall be 100% biodegradable, compatible with the environment, and shall contain no germination-inhibiting components.

2.4 TACKIFIER

- .1 The binder must be capable of joining together the mulch particles to secure the mulch to the ground. The binder shall not form an impervious seal that will prevent the penetration of moisture to underlying soil.

2.5 WATER

- .1 Water supplied by the Contractor shall be free of any impurities that might inhibit germination of the seed.

2.6 APPLICATION RATE

- .1 The minimum application for Hydro-Seeding is 75-100 kg/ha

Part 3 Execution

3.1 NOTIFICATION OF COMMENCEMENT OF WORK

- .1 The Contractor shall notify the Departmental Representative a minimum of 48 hours prior to any seeding work. Seeding operations shall not commence until all areas designated for seeding have been prepared to the satisfaction of the Departmental Representative.
- .2 Seeding operations shall not commence until the Departmental Representative has reviewed the Certificate of Seed Analysis and verified the specified seed mixture supplied.

3.2 SURFACE PREPARATION

- .1 Grading or topsoil placement shall be completed to the satisfaction of the Departmental Representative prior to any surface preparation.
- .2 All eroded areas shall be corrected prior to surface preparation, as determined by the Departmental Representative, using imported material or material adjacent to the area being filled.
- .3 Areas to be seeded shall be finished to a smooth and uniform surface, which is loosened to a depth of not less than 25 mm at the time of seeding. Where necessary, the surface

shall be scarified and the Contractor shall dispose of stones and other debris as determined by the Departmental Representative.

- .4 Seeding will not be permitted on hardened, crusted or rutted soil.

3.3 WEATHER CONDITIONS

- .1 The Contractor shall not proceed with the Work when, in the opinion of the Departmental Representative, weather conditions are unsuitable. The Departmental Representative will not allow work to proceed when wind conditions are such that material is being carried beyond the designated work areas or that the material is not being uniformly applied.

3.4 PROTECTION

- .1 The Contractor shall take reasonable care to prevent the contamination of structures, signs, guardrails, fences, utilities and other installations by his operations. Where such contamination occurs, the Contractor shall remove the offending material using methods acceptable to the Departmental Representative.
- .2 The Contractor shall ensure that hydro-seeding does not dislodge soil or cause erosion.
- .3 The Contractor shall be responsible for the protection of the Work and shall, at his own expense, repair all areas damaged by any cause, until the Work has been accepted by the Departmental Representative.

3.5 RESEEDING

- .1 At locations that fail to show a uniform stand of grass for any reason during the calendar year following the year of initial seeding, the Contractor shall repair the defective locations as determined by the Departmental Representative. A uniform stand of grass will be considered growth that shows no deterioration or bare spots greater than 1 square metre in size, and provides a minimum of 80 percent ground cover as determined by the Departmental Representative.
- .2 The initial inspection of seeding will occur during the month of May of the calendar year following the year of initial seeding. The Contractor shall complete any required reseeding work prior to June 15 of that year. This date will be extended if, in the opinion of the Departmental Representative, the weather conditions prior to June 15 are not suitable for reseeding work.
- .3 Contractor will not be required to reseed any area more than once during the warranty period.
- .4 The Contractor shall supply all materials necessary for reseeding work and complete all reseeding work entirely at his own expense.

END OF SECTION

APPENDIX A



Mitigation Package

Parks Canada Waterton Lakes National Park General Project Best Management Practices

Recommendation & Approval – Version 1.5

Modified for: WLNP-2018-007: Waterton Lakes National Park Bear's Hump and Cameron Falls Trail Improvements

Contact Information

Project Manager:

Don Sears: 403-859-5707

Impact Assessment Office: 403-859-5185

Elizabeth Vincer: 403-632-6681

Parks Canada Emergency Dispatch:

Banff Dispatch: 403-762-1473

First Contact Authority (for large SPILLS):

First Contact Authority: 780-422-4505
OR 1-800-222-6514

24-hour Emergency Dispatch*:

Police, Fire, Ambulance: 9-1-1

* In an Emergency, 9-1-1 operators can also notify Banff Dispatch.



1. Supplementary Mitigations

Include any supplemental, or site-specific mitigations

Borrow Pits:

If local materials are to be used, all borrow areas must be identified prior to construction and approved for use by a Parks Canada Surveillance Officer. Use of overburden from other projects is encouraged (e.g., use of rock scaling debris).

Materials imported from external sources must be pits inspected and approved by the Parks Canada Surveillance Officer to prevent import of invasive plants. Materials may be rejected or additional mitigations may required from quarries with weed infestations. Additional mitigations include:

- Presence of an environmental monitor during loading of materials
- Washing of vehicles and equipment
- Rejection of materials that cannot be washed (e.g., gravel, soil, sand)

Drainage Ditch:

To reduce ground disturbance, minimize the length and dimensions of the drainage ditch along the Bear's Hump trail. The drainage ditch must be field fit in consultation with the surveillance officer and the Parks Canada departmental representative. Ensure drainage ditch is revegetated with appropriate vegetation as determined by the WLNP Vegetation Ecologist to minimize risk for erosion.

Japanese Knotweed:

To reduce the spread of invasive plants, crews and equipment must avoid the Japanese Knotweed zone located southwest of the Bear's Hump parking lot.

Work in Wet Conditions:

As work is proposed for the spring of 2019, when precipitation is anticipated, the erosion and sediment control plan must indicate which activities are of high risk for erosion and will be scheduled outside of periods with poor weather forecast.

Sensitive Features:

Sensitive Features include the riparian area surrounding Cameron Creek and Cameron Falls.

Seismic Station:

The existing seismic station is considered a sensitive site and is outside the approved work limits for this approval.



2. Environmental Surveillance

- 2.1. All projects are subject to environmental surveillance by the SO to ensure that mitigation measures as outlined through the EIA process are implemented during all phases of construction, including clearing, grading, construction, cleanup, and restoration.
- 2.2. The SO will report deficiencies to the PM and summarize site visit observations in a surveillance report. The surveillance report will be filed into a database to supplement information for restoration activities in the future.
- 2.3. The Prime Contractor is responsible for keeping the SO informed of project activities and will notify the SO prior to the following activities:
 - Vegetation clearing and soil stripping < 30 m from sensitive features;
 - Activities in and < 30 m from water;
 - Species at risk mitigation measures;
 - Rare plant mitigation measures; and
 - As otherwise outlined in the project EIA.

3. Project Planning / Design (section n/a)

4. Submissions

- 4.1. Check box of attachments / plans required prior to the start of construction.

Attachments / Plans	Required	Responsible Party	Reviewer and Submission Deadline
Environmental Alignment Sheets	<input type="checkbox"/>		
Erosion and Sediment Control Plan	<input checked="" type="checkbox"/>	Contractor	EA Officer; Must be approved prior to construction.
ERP (Emergency Response Plan)	<input checked="" type="checkbox"/>	Contractor	EA Officer; Must be approved prior to construction.
Spill Response Plan	<input checked="" type="checkbox"/>	Contractor	EA Officer; Must be approved prior to construction.
Fire Contingency Plan	<input checked="" type="checkbox"/>	Contractor	EA Officer; Must be approved prior to construction.
Avalanche Safety Plan	<input type="checkbox"/>		
Site-specific Mitigation Details	<input type="checkbox"/>		
Restoration Plan	<input checked="" type="checkbox"/>	Departmental Representative	If ground disturbance cannot be minimized, develop restoration plan for drainage ditch area on Bear's Hump trail. *No import of seed or vegetation is permitted unless with written permission of the Parks Canada Vegetation Ecologist.
HDD or Geotechnical Drill Plan	<input type="checkbox"/>		



5. Environmental Alignment Sheets (section n/a)

6. Erosion and Sediment Control Plan

- 6.1. An Erosion and Sediment Control Plan (ESCP) will be prepared that covers all construction and restoration periods.
- 6.2. The requirements for an erosion and sediment control plan can be scaled to the scope and associated risks of the project, as determined by the IAO or SO.
- 6.3. The Erosion and Sediment Management Plan will be developed by a qualified professional and is subject to approval of the IAO.

Timing of Works

- 6.4. Schedule work to avoid extreme wet, windy and rainy periods that may increase erosion and sedimentation.
- 6.5. Avoid soil disturbing activities during periods with saturated soils, periods of runoff, high rainfall intensity, high winds, or wet snow. Temporarily stop work when wet ground conditions contribute to erosion and sediment transport.

General Mitigations

- 6.6. Erosion control measures that prevent sediment transport into any waterway, water body or wetland shall be implemented by the contractor.
- 6.7. Identify high risk areas or components of the project including areas with fine-grained soils, sandy deposits, slopes, shallow soils, or adjacent to sensitive features (e.g., riparian areas).
- 6.8. Identify sources of potential runoff (e.g., ditches, slopes) from within the construction site or from upslope areas. Construct and maintain structures to deflect sources of runoff from entering areas of exposed soils (e.g., diversion ditches, vegetative filter strips).
- 6.9. Acquire necessary erosion and sediment control equipment (i.e., landscaping fabric, sediment fences, coir rolls etc.) and install prior to risk of sediment transport.
- 6.10. Minimize slope lengths and angles, promote surface roughness on slopes, and avoid designs and construction practices that result in smooth, uniform slopes. Incorporate texture and organics into the cover of slopes to reduce soil erodibility.
- 6.11. Plan project activities to minimize soil handling.
- 6.12. Limit equipment movement over exposed soils.
- 6.13. Avoid activities that contribute to soil compaction and use practices that roughen and decompact soils to promote infiltration.
- 6.14. Ensure all activities are conducted at least 30 m from waterbodies wherever possible.
- 6.15. Minimize extent of vegetation cover removal and grubbing. Clearly mark construction boundaries to prevent accidental damage to vegetation.
- 6.16. Where vegetation cannot be retained, apply soil covers to erodible areas (granular materials, mulches, tackifier, tarps). Note that tarp covers may not be suitable at most locations in WLNP where high winds are common.
- 6.17. Minimize the length of time soils are exposed and complete work in one area before commencing work in another area.
- 6.18. If vegetation clearing is scheduled early due to timing windows, grubbing should be delayed until just prior to construction activities, in order to maintain soil stability.



- 6.19. Initiate replanting of disturbed areas immediately after construction is completed.
- 6.20. Ensure all erosion and sediment control devices are weed free. Straw and hay based erosion control is not permitted.
- 6.21. Avoid use of coconut matting due to ungulate hoof entrapment.
- 6.22. Maintain and repair all erosion and sediment control structures in a timely manner. If the design of the control measures is not functioning effectively they are to be repaired.
- 6.23. The site will be secured against erosion during any periods of construction inactivity or shutdown.
- 6.24. Install all erosion and sediment control devices according to Typical Drawings included in ESCP. Typical Drawings must be on site and available at the request of the SO.

Minimum Requirements

- 6.25. The minimum requirements of an erosion and sediment control plan include consideration of:
 - o Erosion prevention procedures (e.g., project schedule, minimization of work area, site management, ground cover measures);
 - o Sediment control measures (e.g. sediment fences, check dams, sediment traps, etc.) including specifications and Typical Drawings of sediment control structures;
 - o Detailed plans for instream works including site isolation measures and project timelines (if applicable);
 - o Water management plans including site control, equipment necessary and proposed dewatering locations;
 - o Locations of erosion and sediment control measure application;
 - o Monitoring of prevention and control measures and corrective actions (e.g., repairs).
 - o Removal of non-biodegradable materials once site is stabilized.

7. Emergency Response Plan Module

- 7.1. The general emergency contact for WLNP is 9-1-1.

Spill Response Plan

- 7.2. The Prime Contractor is responsible for ensuring that a Spill Response Plan is developed prior to start of work and the plan is subject to approval of the IAO.
- 7.3. The Prime Contractor is responsible for ensuring that spill kits sufficient to contain and clean up 110% of the site's largest possible fuel / chemical spill must be retained on site at each location of potential spills (sites where equipment is working).
- 7.4. The Prime Contractor is responsible for ensuring that all crew members and sub-consultants on site receive a briefing about the Spill Response Plan and are aware of the location and use of spill kits and containment devices.

General Mitigations

- 7.5. Avoid work in high risk areas, particularly in areas of high water table, steep slopes or in close proximity to streams when precipitation is forecast.
- 7.6. Have spill containment equipment on-hand and ensure that all personnel are aware of their location and trained in their use.



- 7.7. Absorbent booms must be immediately available on site during works in and near water.
- 7.8. Ensure all construction equipment is free of leaks from oil, fuel or hydraulic fuels. See **General Activities** module for the requirements for equipment inspection by the SO prior to entry to WLNP.
- 7.9. The crossing of any waterbody (including wetlands) by construction equipment, or the use of such equipment within waterbodies is strictly prohibited unless prior approval has been confirmed from the SO.
- 7.10. Designate refuelling areas at least 100 m away from any water body. Refuelling activities should not be conducted where run-off could carry contaminants into drainage pathways (including storm sewers).
- 7.11. Hazardous or toxic products shall be stored no closer than 100 metres from streams, wetlands, water bodies or waterways.
- 7.12. Equipment will be fuelled on hardened surfaces wherever possible.
- 7.13. Spill kits shall be provided at re-fuelling, lubrication, and repair locations.
- 7.14. Dispose of contaminated materials at provincially certified disposal sites outside of WLNP. No treatment of contaminated soils (e.g., bioremediation) is allowed in WLNP. All applicable documentation demonstrating proper disposal will be provided to Parks Canada.
- 7.15. If potentially hazardous materials (e.g. cement-based products, sealants or paints) are used on site ensure raw material, mixed compounds and wash water are not released to any watercourse or soils. Secondary containment 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 are required.
- 7.16. All gas generators and water pumps require secondary containment. Electric pumps are preferred.
- 7.17. Follow all applicable regulations and codes for the management and handling of hazardous waste.
- 7.18. 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 Prime Contractor. The site will be inspected by the SO to ensure completion to the expected standard and to the satisfaction of Parks Canada.
- 7.19. Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- 7.20. The SO shall be notified immediately of any spill. In the event of a major spill, Banff Dispatch (403-762-1473) shall be notified immediately along with the First Contact Authority (1-800-222-6514).

A major spill is defined below:

Material	Immediate Notification Requirements	Written Spill Report Requirements
Any deleterious substance that enters a water body of any type (e.g., stream, lake, wetland, drainage, sewer) or poses a threat to human safety (e.g., slippery road, explosive hazard, poisonous gas).	Any Quantity, notify the SO and Banff Dispatch.	Required; Major Spill



Any substance that is hazardous or toxic to the environment including but not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement, sand blasting agents, paint, solvents and hydrocarbons (e.g., fuel, grease, hydraulic fluid).	<100 L, immediately notify the SO. > 100 L, immediately notify the SO and Banff Dispatch.	At the discretion of the SO. Major Spill if not contained. Required; Major Spill
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Minimum Requirements

7.21. The Spill Response Plan must at minimum, include the following information:

- List of products and materials 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, sand blasting agents, paint, solvents and hydrocarbons.
- required equipment on site and location of spill kits;
- spill prevention procedures (i.e., containment and storage of materials, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products in accordance with all applicable federal and provincial legislation);
- fuelling procedures, fuel storage;
- spill response (i.e., containment, clean-up, disposal of contaminated materials, etc.);
- spill reporting procedure; and
- up-to-date emergency response contact list including contact information for reporting spills.

Spill Reporting Requirements

7.22. Immediate spill reports are verbal notifications and must include all available information. Follow-up written spill reports must include the following:

- Prime Contractor Name
- Name and Contact Number
- Location and time the spill occurred
- Type and quantity of the substance spilled
- Cause of the spill
- Size of area the spill spread to
- Was the spill in water or on land
- Does the spill have potential to enter a water body
- Detail of immediate action taken to control the spill
- Additional actions required or ongoing to control the spill
- Any restoration required at the spill site
- Names of PCA representatives that were present at the spill site

Fire Contingency Plan

7.23. An emergency fire contingency plan is required for projects where risk of fire exists (e.g. for operations on dry grassland habitats) as requested by the IAO in consultation with the Fire Management Officer.

7.24. Fires or burning of waste materials is not permitted.



- 7.25. The Prime Contractor is responsible for ensuring that all crew members and sub-consultants on site receive a briefing about the Fire Contingency Plan and are aware of the location of emergency equipment, such as fire extinguishers.
- 7.26. Where an emergency fire contingency plan has been requested, the prime contractor should provide, at minimum the required equipment as defined in the Schedule of the *Alberta Forest and Prairie Protection (Ministerial) Regulation*.
- 7.27. The fire contingency plan must at minimum contain the following information:
 - required equipment on site;
 - fire prevention procedures;
 - initial response;
 - fire reporting procedure; and
 - up-to-date emergency response contact list.

Table 1 Adapted Alberta Forest and Prairie Fire Protection (Ministerial) Regulations AR 65/2017, Schedule

Required Equipment for Fire Control	People Employed at the Site of Operations									
	1	2	3	4	5	6-10	11-20	21-30	31-40	41+
Shovels	1	1	2	2	3	5	10	15	20	Same as 31-40 plus increase as required by SO in consultation with the Parks Canada Fire Management Officer.
Back pack with pump	1	1	1	2	3	5	10	15	20	
Axe or Pulaski	1	1	1	1	2	5	10	15	20	
Fire pump	0	0	0	0	0	0	0	1	1	
Fire hose (metres)	0	0	0	0	0	0	0	450 m	450 m	
Power saw	0	0	0	0	0	0	0	1	1	

8. General Activities Mitigations Module

Construction activities involve the use of laydown/staging areas, equipment operations, storage and handling of hazardous materials. Potential adverse effects include: alteration of vegetation, erosion and sedimentation, constriction for wildlife movements and introduction/spread of non-native vegetation.

- 8.1. All employees must attend an environmental briefing with a SO before beginning work at the site to review and explain the mitigations that are conditions of the project approvals. Employees must attend this briefing before beginning their work at this site.
- 8.2. All equipment and vehicles will be made available for inspection by the SO on arrival to WLNP. The Prime Contractor will give 48 hours' notice and schedule equipment inspection with the SO.

Construction Timing / Visitor Experience

- 8.3. Time activities to minimize vehicle conflicts on access roads (i.e., where possible, schedule activities so that equipment operations does not disrupt traffic flow; result in wildlife collisions).



- 8.4. All Parks Canada designated speed limits apply to construction vehicles. Additional speed restrictions may be required to protect wildlife and visitor safety.

	Required	Location	Notes
Additional Speed Limits	<input type="checkbox"/>	n/a	n/a
Work Hour Restriction	<input checked="" type="checkbox"/>	Cameron Falls Trail	At the discretion of the Departmental Representative, crews may be required to avoid noisy construction activities during periods of busy visitation such as long weekends.
Designated Truck Routes	<input type="checkbox"/>	n/a	Use existing access roads.

Timing Windows

- 8.5. Timing windows to reduce erosion, maintain compliance with the *Migratory Birds Convention Act*, *Fisheries Act*, *Species at Risk Act* and may be part of best practices to reduce erosion and environmental effects. See detailed mitigations for timing windows under **Erosion and Sediment Control**, **Vegetation Removal** and **Buildings** modules where these activities are part of project works. A summary of these restrictions is made below.

Consideration	Applicable	Restricted Window	Notes
Migratory Bird General Breeding Period	<input checked="" type="checkbox"/>	April 1 to August 31	Follow mitigations for vegetation removal in section 7.
Bat Maternity Roost Activity Period	<input checked="" type="checkbox"/>	April 1 to August 31	Follow mitigations for vegetation removal in section 7.
Bat General Activity Period	<input checked="" type="checkbox"/>	April 1 to October 31	Follow mitigations for vegetation removal in section 7.
Amphibian Calling Window	<input type="checkbox"/>	April 15 to June 15	n/a
Bull Trout Restricted Work Periods	<input type="checkbox"/>	August 31 to August 15	n/a
Other Fish Species Restricted Work Periods	<input type="checkbox"/>	Consult IAO	n/a
Grassland Dormancy	<input type="checkbox"/>	October 1 to February 28	n/a
Additional Timing Considerations (e.g., weed seed set, soil protection)	<input type="checkbox"/>	Dry late summer and fall conditions	n/a

Work Site Conditions/Staging/Laydown

- 8.6. Minimize vegetation-clearing activities and ground disturbance by staging on existing hardened areas wherever possible.
- 8.7. Delineate the work zone; clearly mark the limits to active construction, sensitive features and the access and egress locations.
- 8.8. The Prime Contractor is responsible for security and safety of the work site.
- 8.9. Strong winds are a regular occurrence in WLNP. Prevent materials from blowing off of work site.
- 8.10. If contamination is found, cease work immediately and if necessary, implement Emergency Response Plan.

Wildlife Observations and Encounters

- 8.11. Notify the SO immediately of any dens, litters, nests, carcasses (road kills or other), wildlife encounters, or carnivore (bears, wolves or cougars) observations on or around the worksite.



- 8.12. If wildlife is observed at or near the work site, allow the animal(s) the opportunity to leave the work area to the surrounding habitat and away from areas of potential conflict.
- 8.13. If potentially dangerous wildlife (e.g., bear, cougar, wolf, deer, sheep) persistently enter the work area or display aggressive behaviour, the contractor will immediately stop work, notify 9-1-1 or Banff Dispatch (403-762-1473), and safely evacuate the area.
- 8.14. Contractor will make bear spray, bear spray training, and wildlife awareness training mandatory to all workers on site.
- 8.15. Secure all materials that might attract wildlife (e.g. petroleum products, human food, recyclable food and drink containers and garbage).
- 8.16. No feeding, baiting or luring of any wildlife (including bears, small mammals, birds); do not approach or harass wildlife in any way. Notify the SO immediately if wildlife obtain garbage or human food. If wildlife get into attractants that have been intentionally or accidentally left out, individuals or the contractor could be charged under the *Canada National Parks Act* Regulations.

Equipment Operations & Fuelling

- 8.17. Equipment movements and workers' private vehicles shall be restricted to the designated footprint of the construction area.
- 8.18. Protective measures, including using appropriately sized equipment, or protective access matting must be employed if entry into wet areas is required.
- 8.19. Machinery must arrive on site in a clean and dry condition and be maintained free of fluid leaks, vegetative material (*i.e.*, invasive species, noxious weeds) and soils from off-site. All construction equipment from outside WLNP will be washed prior to arrival to minimize the risk of introducing weeds or aquatic invasive species. Additional weed-cleaning stations may be designated by the SO depending on project activities and locations (see table below).

	Required	Location(s)	Notes
Are additional weed cleaning stations required?	<input checked="" type="checkbox"/>	<p>Crews and equipment must avoid the Japanese Knotweed zone located southwest of the Bear's Hump parking lot.</p> <p>If crews or equipment accidentally come into contact with this soil, immediate and extensive weed cleaning is mandatory.</p> <p>Equipment must be cleaned thoroughly to be free of soil and vegetative material and inspected by a Surveillance Officer prior to further use or demobilization.</p>	Japanese Knotweed is a highly invasive and destructive plant that can spread through roots hidden in contaminated soil.

- 8.20. Inspect equipment daily for fluid/fuel leaks and maintain equipment in good working order.
- 8.21. Equipment fuelling and maintenance sites will be identified by the Contractor and approved by the SO. Fuelling should occur on hardened areas > 100 m from streams,



wetlands, waterbodies or watercourses. Fuelling personnel shall maintain presence at and provide immediate attention to the fuelling operation.

- 8.22. Mobile fuel containers (e.g., slip tanks) shall remain in the service vehicle at all times.
- 8.23. Operate machinery on land above the high water mark, on ice, or in another manner that minimizes disturbance to the banks and bed of any water body.
- 8.24. Equipment that will work adjacent to or within a stream or watercourse should be free of external grease, oil or other fluids, excessive mud, dirt and vegetation before entering the work area.

Small Equipment

- 8.25. All small equipment (e.g., chainsaws, mowers, etc.) should be kept in good working condition and free of oil and fuel leaks.
- 8.26. Where possible, chain oil should be vegetable-based.
- 8.27. Fuelling of chainsaws will take place outside of riparian areas and sensitive features.

Site Clean Up/Waste Disposal

- 8.28. Clean tools and equipment at an appropriate off-site facility to prevent the release of wash water that may contain deleterious substances.
- 8.29. Sweep up loose material or debris. Any material that may pose a risk of contamination to soils, surface water or groundwater should be disposed of appropriately off-site.
- 8.30. No construction waste (sawdust, soil, vegetation, debris, pumped water, hydrocarbon, chemicals, cement, asphalt, etc.) shall be allowed to enter an aquatic habitat or be deposited on undisturbed lands unless the said lands are part of the project works and approved for temporary waste storage.
- 8.31. Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in WLNP. These wastes shall be contained and removed in a timely and approved manner and disposed at an appropriate waste landfill site located outside WLNP.
- 8.32. Construction waste storage containers, shall be emptied when 90% full. Waste containers will have lids, be wildlife proof if containing attractants, and waste loads shall be covered while being transported.
- 8.33. Sanitary facilities, such as a portable container toilet, shall be provided and maintained in a clean condition. Sanitary facilities must be in good condition, and located away from sensitive resources including water bodies.
- 8.34. Camping and other recreational activities at the work site by contractors is not permitted.

Air Quality Mitigations

- 8.35. Minimize idling of engines at all times.
- 8.36. Schedule dust generating activities during periods with lower wind speeds.
- 8.37. Ensure fine materials being transported are covered and protected.

Cultural Resources

- 8.38. All work in WLNP is subject to the accidental finds clause whereby on finding any unexpected Cultural Resources, workers shall stop work in the immediate area and notify the SO. Parks Canada's Terrestrial Archaeology section will provide advice and



assessment of significance and determine requirements to mitigate the chance find. Examples of archaeological artefacts encountered in WLNP include buried bison bones, stone tools, and above ground cairns.

- 8.39. Where deep excavation is planned within the townsite, notify the Parks Canada Terrestrial Archaeology section to coordinate a site visit to look at the subsurface deposits with buried soils whenever possible.
- 8.40. If applicable, follow additional mitigations outlined in the Cultural Resources Impact Assessment.

	Required	Location(s)	Notes
Are additional mitigations for cultural resources required?	<input type="checkbox"/>		

9. Vegetation Removal Mitigations Module

Project activities that may alter or remove vegetation include mowing, brushing, and landscape maintenance activities, non-native species management, fire hazard reduction and prescribed burn operations and pre-construction site clearing. Grubbing (stump and root removal) may be required to prepare the ground surface for other activities.

Wildlife Timing Windows

All vegetation, including grassland, has the potential to provide habitat for wildlife. Applicable timing windows for individual project vegetation removal is listed under the **General Activities Mitigations Module**.

- 9.1. The regional bird/songbird nesting period in WLNP is **April 1 to August 31**. Avoid all vegetation removal during this time. If vegetation removal is scheduled to occur within this period, the SO may complete pre-work surveys for nesting migratory birds or outline additional mitigations in the timing windows section of the BMP.
- Nesting surveys must be completed within 7 days of project activities.
 - There is a **risk of delays** to project activities due to the presence of nesting migratory birds.
 - If a nest is found during the pre-work surveys, the vegetated area will be left intact with a suitable sized protected buffer until the young have left the nest and vicinity. Size of buffer is species dependent, to be determined by the SO in consultation with federal regulatory guidance.
- 9.2. Vegetation clearing can negatively impact bats in spring and summer. The timing windows for avoidance of vegetation removal activities in WLNP is April 1 to August 31 for vegetation likely to support roosting bats. If vegetation removal is scheduled to occur within this period, the SO may complete pre-work surveys for bat roosts.
- Roosting surveys must be completed within 7 days of project activities.
 - There is a **risk of delays** to project activities due to the presence of bat roosts.
 - If a potential bat roost is located, a site-specific mitigation strategy must be developed dependent on the type of roost and species present, to be determined by the SO in consultation with federal regulatory guidance.



- 9.3. Vegetation removal can negatively impact amphibians and reptiles, especially during breeding, transformation and important movement periods within and close to wetlands.
- If vegetation removal is to occur within 300 m from a confirmed or potential amphibian breeding wetland, or within 500 m from a confirmed SAR amphibian breeding wetland, additional impact analysis may be required and site-specific mitigations developed.
 - If vegetation removal is scheduled to occur during non-frozen conditions, the SO may complete an amphibian and reptile ground search immediately prior to equipment activities.
 - If ground disturbance activities are scheduled to occur in frozen conditions, amphibian exclusion fencing may be required in the preceding fall season at the discretion of the SO.

Other Timing Considerations

- 9.4. Where ground disturbance accompanies vegetation removal, time activities to minimize soil handling, soil compaction, and erosion potential. Avoid extreme dry windy and wet conditions.
- 9.5. In areas with weed infestations, reduce weed spread through vegetation removal prior to seed set.

Vegetation Removal Mitigations

- 9.6. If previously unidentified sensitive features are found during construction, immediately stop work and notify the SO (e.g., raptor nest).
- 9.7. Vegetation removal should be limited to the minimum area required for safe operations during construction or to meet the objectives of the clearing activities (i.e., fire breaks, sight lines etc.).
- 9.8. Minimize full removal and retain vegetation when possible to reduce erosion.
- 9.9. Retain 30 metre vegetated buffer around sensitive features; where disturbance is unavoidable < 30 metres, a restoration plan is required and the SO must be on site during disturbance activities.
- 9.10. Do not deposit debris in water bodies.
- 9.11. Limbing must be completed using the appropriate equipment to minimize damage to the tree (i.e., using a hoe bucket to limb trees is not appropriate as it can cause the bark to tear and can make the remaining tree vulnerable to diseases and rot).

Tree removal

- 9.12. Safety of workers and the public is the first priority for all tree removal operations. In consultation with the SO, felling of snags or hazard trees outside the designated work area may be permitted, where required for safety of fellers.
- 9.13. Unless approved by the SO due to site-specific limitations, trees must be felled away from sensitive features, such as watercourses, wetlands, riparian zones, or ecological features.
- 9.14. Ensure tree limbs/stumps are flush cut as close to the ground or stem as possible.
- 9.15. Fallers should assess each tree individually for critical wildlife features such as nests or cavities. Notify the SO if unexpected features are identified.



- 9.16. Mechanical falling can be used only where it is determined that machines will cause minimal site degradation, due to suitable soil conditions, or on a site that is to be developed for future access or facilities.
- 9.17. Mechanical falling may be preferable on sites with numerous hazard trees to be retained for their habitat values, or where mechanical falling equipment can be used to minimise soil disturbance and better direct fallen trees away from environmentally sensitive areas.
- 9.18. Logs and other salvage materials are to be conveyed to and placed at a 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.
- 9.19. 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.
- 9.20. Where possible, preserve identified wildlife trees by limbing or topping if they are not assessed as hazard trees.

Disposal of Vegetation Debris

- 9.21. Where practicable, as much of the coarse woody debris and organic matter from the tree removal should remain on the site and used in restoration. The quantity and distribution of slash remaining must not impede wildlife movement, choke out native vegetation, create a significant fire hazard or cause an excessive nutrient flush.
- 9.22. All debris that is not being disposed of on-site must be removed as soon as possible from the project footprint, by transporting off-site for disposal.
- 9.23. If temporary storage is required, store debris on already disturbed areas to minimize footprint of disturbance.
- 9.24. All vegetation containing non-native species will be bagged and removed off site to disposal facility.
- 9.25. On approval of the SO, vegetation debris may be taken to the WLNP burn pile at the upper government compound provided all materials are transported, placed and sorted according to current WLNP requirements.
- 9.26. If removal is not feasible a chipper may be used for less than 50 boles per hectare. Chip depth is to be a maximum of 5 cm (2 inches), spread over area no greater of 5m x 5m per hectare so as to not cover underlying vegetation, prevent new native seedlings from sprouting, and cause soil/seed bank sterilization. Spreading of chips may extend beyond these parameters with approval by the SO.
- 9.27. Firewood must be salvaged, bucked and stacked at the government compound.
 - o Firewood Tree: one that has a minimum diameter off 15 cm outside bark at stump height (30 cm) and a usable length of 4.88 m to a 10 cm diameter (inside bark).
 - o Fire Piece: One that is 2.44 m (plus 5 cm trim allowance) or longer, with a 10 cm (inside bark) small end, where rot content or form does not render it unusable.

Herbicide Use

- 9.28. A Field Unit Integrated Pest Management Plan (IPMP) must be completed and approved prior to the use of herbicides to ensure the most effective and least harmful substances are properly used.



10. Soil Handling Mitigations Module

To successfully complete restoration of disturbed areas, and protect areas from erosion, proper soil handling and backfilling procedures must be followed. Post excavation and stripping soil and vegetation restoration mitigations should be applied. See Section 10 of this BMP for **Soil and Vegetation Restoration**.

- 10.1. All soil handling activities require consideration of erosion and sediment control.
See ESCP Section.

Soil Stripping

- 10.2. No stripping shall occur outside of the delineated work area or within 1 metre of the drip line of existing forest.
- 10.3. Stripping close to any watercourse, water body or wetland shall employ methods to ensure materials are not pushed, do not fall or erode into the water or wetlands.
- 10.4. Soil must be stripped in accordance with the **ESCP**. Key components for soil stripping are:
 - Minimize soil movement and handling at all times.
 - Strip topsoil under dry conditions, whenever possible.
 - In the event of a work program shutdown during inclement weather (e.g. winter conditions unfavourable for construction, heavy rain events, construction delays, etc.) contingency planning for bared soils or excavated material stockpiles is required.

Topsoil Salvage

- 10.5. Salvage topsoil at all excavation sites for restoration purposes.
- 10.6. Prevent loss of topsoil through wind or water erosion.
- 10.7. Usually the upper 15 cm of soil, below the sod layer if present, is considered topsoil, where topsoil depths exceed 15 cm then salvage the entire depth of topsoil.
- 10.8. Where depths exceed 15 cm, salvage the upper 15 cm of topsoil separately from the remaining, where the seedbank is filled with desirable native seed material.
- 10.9. The SO may designate separate storage of topsoil zones whereby forest soils are stored separately from grassland soils and weed contaminated soils are separated from clean topsoil.

Excavation

- 10.10. All trenches or ditches left unattended overnight must be fenced or covered to prevent wildlife entrapment or provide appropriate egress for wildlife.
- 10.11. Workers must inspect trench for trapped wildlife prior to backfilling. If trench has been left open for > 24 hours, SO must be notified and time allowed for the SO to complete additional inspection for trapped wildlife such as salamanders.
- 10.12. 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.
- 10.13. Special precautions may have to be taken during excavation in the vicinity of intermittent or active drainage channels.



- 10.14. Minimize changes to the ground surface that affects its infiltration and runoff characteristics and maintain/re-establish effective surface drainage on completion of the project.
- 10.15. Backfill and compact excavations as soon as possible. Optimize degree of compaction to minimize erosion and allow for re-vegetation.
- 10.16. To limit over compaction, use equipment which minimizes surface disturbance including low ground pressure tracks/tires, blade shoes and brush rake attachments.
- 10.17. All excavations will remain free of water (see dewatering mitigations).

Excavated Material Storage

- 10.18. Allow space for separate storage of topsoil and spoil; where space is available, separate stored topsoil from spoil by at least 1 m. Use appropriate material (e.g., geo-textile) to separate soil components where space is limited.
- 10.19. Topsoil from separate ecotypes or areas of the project may not be mixed without approval of the SO (i.e., grassland soils must be kept separate from forested soils).
- 10.20. Topsoil may be stored on hardened surfaces, geo-textile material, in topsoil storage containers or directly on undisturbed vegetation. If storage occurs on vegetation, material recovery by hand may be required.
- 10.21. Topsoil should be stockpiled on the uphill side of the disturbance on sloped terrain and away from any grades, subsoils, spoil material, construction activity and day to day operations.
- 10.22. Construct barricades to prevent losses on steep terrain ($>18^\circ$, 3:1).

Excess Materials and Waste (Overburden Removal)

- 10.23. Remove excess excavated material from site where it cannot be used for the final grading of the area. Site specific arrangements must be made for disposal locations and procedures of overburden.
- 10.24. Surplus excavated material may be used to fill depressions around the project site providing topsoil is stripped before filling, with approval from SO.

11. Soil and Vegetation Restoration Mitigations Module

Almost all projects activities included in this BMP will require some ecological restoration- *the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed*. The restoration plan can be a simple application of the following mitigations and can be at the site or both at the site and in concert with another site designated to offset the permanent impact of a project. A restoration plan is required for all projects but the scale and scope can be adapted to that required by the project (i.e., BMPs, site restoration plan, etc.). Restoration works can often be considered projects in and of themselves. Soil and vegetation restoration must apply the principles of effective, efficient and engaging solutions.

Restoration Plan

- 11.1. Develop restoration plan as part of the project scoping and specifications prior to project approvals.
- 11.2. Ensure that the appropriate restoration materials are available as needed immediately following construction activities.
- 11.3. The restoration plan will be subject to the approval of the IAO, who will be responsible for consulting with the Park Vegetation Ecologist.



11.4. The restoration plan should the following minimum information

- Site description;
- Site-specific restoration goals and objectives;
- Schedule of clean-up activities;
- Timing of restoration activities;
- Restoration Standards; and
- Follow-up Protocols (i.e., supplemental seeding, native transplants, weed control, etc.)

Timing Windows

- 11.5. Complete initial seeding as soon as possible.
- 11.6. Supplemental planting should be timed for the species and location. Seeding in the fall allows for full scarification of the seed over the winter. Consider using seed that requires shorter scarification times for spring and summer applications. Transplants may do best in the spring and summer and can require watering or other maintenance.
- 11.7. Time weed control measures to prevent seed propagation.

Topsoil Replacement

- 11.8. Implement restoration plan for the disturbed area immediately following completion of construction.
- 11.9. Minimize soil movement and handling to protect existing native seed bank.
- 11.10. Replace topsoil to all areas immediately following fine grading.
- 11.11. Do not compact topsoil.
- 11.12. Backfilling should allow settling to prevent depressions however, long term roach piles on linear disturbances should be minimal.
- 11.13. Where insufficient topsoil is available, the SO may approve moving soil from different projects or areas of WLNP. Imported soil may be used as a last resort and must be from a supplier that has been inspected and approved by the Park Vegetation Ecologist. Methods of improving vegetation succession using locally sourced, weed and contaminant free materials are preferred.
- 11.14. Slopes to be seeded should be no steeper than 2 horizontal to 1 vertical (2:1) and covered with a minimum of 5 cm (2 inch) of topsoil. Finish grading should always follow top soil placement. Maintain structure (i.e., rocks, roots, woody debris) in topsoil.
- 11.15. Where remaining soils are unstable due to steepness or soil characteristics, immediate installation of sod or other erosion control is required.
- 11.16. Methods of bioengineering such as terracing, willow staking, live pole drain systems should be assessed as solutions where soils are steeper or remain unstable.

Soil Amendments

Fertilizer Application

- 11.17. Avoid use of fertilizer to limit non-native vegetation growth and allow for local species to use available nutrients.
- 11.18. If needed use locally sourced mycorrhizae compost teas to improve vegetative success, as approved by WLNP vegetation ecologist.



Topsoil substitute

- 11.19. Apply an organic cellulose only amendment as a soil substitute if restoration standards are not being met within the defined time frame.
- 11.20. Determine the type of organic amendment based on the site-specific requirements (e.g., peat moss, compost) at the discretion of WLNP vegetation ecologist.

Seedbed Preparation

- 11.21. The seedbed will be scarified by hand or, with the approval of the SO, by machine on large areas (i.e., roadbeds) where it is accessible and appropriate.
- 11.22. The seedbed will be scarified if seeding takes place more than 7 days after final grading or if there has been a rainfall between final grading and the seeding date.
- 11.23. The cleats of a tracked vehicle or a harrow device will be used, where possible, to prepare an adequate seedbed with seedling safe-sites (microsites) substantially free of soil crusts.
- 11.24. Align cleat marks at right angles on slopes to trap seed and sediment and reduce erosion.

Species Selection

- 11.25. When selecting species and varieties:
 - Use species of local native plant communities.
 - Avoid use of cultivars.
 - Species viability in proposed environment and climatic conditions.
 - Capability to effectively control erosion, where required.
 - Adaptation to the variable site conditions of undulating topography.
 - Consider palatability of some species to herbivores and avoid growing attractants in areas of increased risk to wildlife and visitors.
 - Variable life expectancy to produce variable, delayed die-out of seeded species and replacement with indigenous native plants.

Seed Mix Selection

- 11.26. A prescriptive seed mix appropriate for the project area will be provided by Parks Canada. If an appropriate seed mix is not available, the SO will contact the Park Vegetation Ecologist to determine an appropriate mix for the Project.
- 11.27. Percentage of individual species within mixes are approximate and may vary depending on seed availability. A number of native species that are available only in limited quantities commercially have been included in the seed mixes. These seed mixes are to be used conditional on availability of individual species; modifications/replacements are allowed, subject to approval by the WLNP Vegetation Ecologist.
- 11.28. Prior to seed purchase, certificates of seed analysis will be provided to the Vegetation Ecologist for approval.
 - Do **NOT** purchase seed until written approval is obtained.
 - Certificates of Analysis must include both the common and include the scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other



species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier will be included.

- 11.29. All seed is subject to testing by PCA prior to use.

Seeding

- 11.30. Use only seed purchased after written approval is obtained.
- 11.31. Seed and stabilize (e.g. mulch/tackifier) bare areas as soon as possible after disturbance, preferably as soon as a significant area is graded and finished and before the next rain event. If there is a risk of seedling mortality as a result of fall frost stabilize until appropriate growing conditions exist.
- 11.32. In previously disturbed lawn areas of the Waterton Community, consider using sod in high traffic areas or places that need extra erosion control.
- 11.33. Use temporary seeding when outside the seeding dates for permanent vegetation.
- 11.34. Apply a seed mixture which is appropriate for the climate, soil, and drainage conditions of the site.
- 11.35. Apply seed at a rate appropriate to the seed mixture, seeding method and existing vegetation conditions.
- 11.36. Conduct broadcast seeding under calm wind conditions. Hydro-seeding is acceptable where access is available.
- 11.37. Do not increase the seeding rate to compensate for poor seedbed conditions.
- 11.38. Monitor temporary erosion control measures to prevent seed loss.
- 11.39. Supplemental seeding may be required in subsequent years.

Alternatives to Seeding

- 11.40. Use topsoil seed bank in small areas when there is no risk of erosion or competition from invasive species (i.e., natural regeneration).
- 11.41. Use native transplants in areas where conventional seeding applications are not applicable or where slope stability is an issue.
- 11.42. Use native transplants to provide additional diversity and structure to supplement seeding.
- 11.43. Use conventional forestry planting methods for container grown transplants, see [website](#) for guidance.

12. Slope Stabilization, Drilling and Blasting Mitigations Module (section n/a)

13. Asphalt Production and Handling Mitigations Module

Asphalt is a common building material for transportation infrastructure. Its production requires the use of gravel, water, and petroleum products, and associated project activities include transportation, storage and handling of these materials. Installation of asphalt plants is common within the larger parks where gravel extraction is undertaken.

Timing of Works

- 13.1. Asphalt works are preferably undertaken during periods of dry weather as this allows easier control of contaminated runoff and sediment.



- 13.2. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters, particularly for surface repair works requiring the application of patching and sealing compounds, tar, asphalt, and chemical surface sealants.

Gravel Crushing and Washing

- 13.3. Where possible within engineering constraints, asphalt materials should be recycled to reduce the need for new gravel.
- 13.4. Materials will be obtained from an approved borrow pit only. See supplemental mitigations related to material sources.
- 13.5. Gravel will not be crushed within 30 meters of any water body.
- 13.6. If water for cleaning is extracted from a watercourse, refer to **water withdrawal section** of this BMP.
- 13.7. If gravel requires washing, the water used will not be returned directly to any watercourse.
- 13.8. Water free from chemical contaminants will be discharged into ground where further erosion and runoff into surface water is prevented. Discharging into well vegetated ground surface, at a rate which prevents erosion can often provide increased absorption and reduction of sediment load.
- 13.9. Contaminated water must be treated to meet CCME guidelines or transported outside of WLNP for disposal at an approved facility.
- 13.10. For waste removed from WLNP a detailed receipt of delivery to an approved facility will be provided to the SO.

Disposal and Clean Up of Other Waste Products

- 13.11. To ensure regular clean-up of waste asphalt and petroleum spills, a defined clean up schedule will be established during the preconstruction meeting.
- 13.12. Leaks will be collected in drip-trays, the collected material will either be removed from WLNP, or recycled back through the Asphalt Plant. For any material removed outside WLNP to an approved facility, a detailed receipt will be provided to the ESO.
- 13.13. Used oil, filters, grease cartridges, oil cans and other waste products of plant servicing will be collected and disposed of at the nearest industrial waste facility.

14. Concrete Handling Mitigations Module

Concrete is a common construction material. Its use ensures longevity of the infrastructure and safety for public use. One litre of concrete wash water or leachate in 1000L of water will kill fish. Cement-based products including grouts and concrete are lethal to fish and many other aquatic organisms. Raw product or leachate entering a watercourse will alter water chemistry, making it more basic or alkaline.

Onsite Temporary Concrete Washout Facility

- 14.1. Temporary concrete washout facilities shall be located a minimum of 100 m from storm drain inlets, open drainage facilities, and watercourses.
- 14.2. Temporary concrete washout facilities shall be temporary pit or bermed areas constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.



- 14.3. Wood stakes, and sandbag materials can be used to construct temporary containment walls or “barriers”.
- 14.4. Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material.
- 14.5. The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.
- 14.6. Washout of concrete mixer trucks is typically not permitted in WLNP. If required, contractors may apply to the SO for a restricted activity permit. The Contractor must provide details of how washout fluids and materials will be suitably controlled.
- 14.7. Wash concrete from mixer truck chutes/pumps into approved concrete washout facility or collect in an impermeable bag for disposal.
- 14.8. Pump excess concrete in concrete pump bin back into concrete mixer truck.
- 14.9. Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.
- 14.10. Once concrete wastes are washed into the designated area and allowed to harden, the concrete shall be broken up, removed, and disposed of per federal and provincial regulations.

Maintenance and Inspection of Temporary Concrete Washout Facilities

- 14.11. Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 100 mm (4 inches) for above grade facilities and 300 mm (12 inches) for below grade facilities.
- 14.12. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition.
- 14.13. Existing facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- 14.14. Temporary concrete washout facilities shall be inspected for damage (i.e. tears in PVC liner, missing sand bags, etc.).
- 14.15. Onsite concrete waste storage and disposal procedures should be monitored at least weekly or as directed by the SO.

Removal of Temporary Concrete Washout Facilities

- 14.16. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled and restored.

Onsite Concrete Management

- 14.17. Rolling concrete mixers with surplus concrete in amounts less than one cubic metre of wet concrete may waste this concrete in a right-of-way as directed by the SO in areas that drain well away from watercourses. Surplus amounts in excess of one cubic metre are to be returned to the batching yard.
- 14.18. Water contaminated in the placing of cement and curing of concrete shall be contained and removed from the site to an approved disposal facility.
- 14.19. The concrete batching plant must be operated pursuant to applicable dust, air emission, and water quality control regulations.
- 14.20. 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, or removed from the site subject to approval and direction from the SO.

15. Paving, Resurfacing, Grading Mitigations Module

Surface management activities are undertaken to ensure public safety on PCA surfaces by maintaining clean, level, and unbroken road surface conditions through activities such as pavement cleaning, patching, application of surface treatments, and pavement crack sealing. Grading is used to address drainage issues, vegetation encroachment, potholes and rough surfaces.

Timing of Works

- 15.1. Works are preferably undertaken during periods of dry weather (e.g., summer) as this allows easier control of contaminated runoff and sediment.
- 15.2. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters, particularly for surface repair works requiring the application of patching and sealing compounds, tar, asphalt, and chemical surface sealants.

Grading

- 15.3. During grade construction conducted close to any watercourse, water body or wetland ensure materials are not pushed, fall or are eroded into the water or wetlands.
- 15.4. No grade building shall occur outside of the delineated work area or within 1 metre of the drip line of existing forest. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage trees or vegetation.
- 15.5. Materials shall be placed at storage sites or on the grade without spillage outside the work limits. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage trees or vegetation.
- 15.6. Retain a 30 metre vegetated buffer around water bodies or install runoff management structures.
- 15.7. If possible, grade roads early in the spring before vegetation develops seed heads or late in season after vegetation has set seed and is dormant to minimize non-native vegetation propagation.
- 15.8. Ensure gravel or road bed material is free of weeds and comes from an approved operational gravel source free of other contaminants.

Paving and Resurfacing

- 15.9. Minimize changes to the surface that could affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface waters.
- 15.10. Minimize application of seal coats in wet conditions. Attempt to apply only to dry surfaces and not prior to (within 24 hrs.) or during rainfall. If unforeseen rain arrives ensure runoff from recently seal coated surfaces are prevented from entering surface waters.
- 15.11. For asphalt handling and management see the [Asphalt Mitigation Module](#) of the BMP.



Pavement Marking and Barrier and Guardrail Reinstatement

- 15.12. Minimize changes to the surface that could affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface water. 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. to the satisfaction of the SO.

16. Works Over or Immediately Adjacent to Water

Works over or immediately adjacent to water include activities associated with the maintenance and repair of bridge structures and/or viewing platforms located adjacent to water. Activities could include the cleaning and painting of structures as well as the repair, rehabilitation, and replacement of elements including decks, railings, abutments, and bearings. Works may include asphalt, concrete works, chipping, painting, grouting, timber truss, abutment and piling maintenance. These activities help ensure bridge structures remain structurally sound and safe for public use.

Repairs Using Treated Wood Products

- 16.1. Untreated wood products are recommended, if treated wood is to be used, ensure it has been treated with a wood preservative appropriate for the project. Refer to the *Parks Canada Guide for the Use, Handling and Disposal of Pressure Treated Wood 2009* and any further updates from *Parks Canada Real Property – Environmental Management*.
- 16.2. If treated timber must be cut to size, ensure cutting takes place away from the bridge and watercourse. Sawdust from treated wood is harmful to aquatic organisms and must be prevented from entering any watercourse.
- 16.3. Wood preservatives should be applied in a contained area and not be applied over or within 200m of water.

Bridge and Structure Painting

- 16.4. Ensure paint flakes, abrasive grits and abrasive/paint flake mixtures do not enter the watercourse as they may leach toxic heavy metals into receiving waters and/or be ingested by fish.
- 16.5. Install ground covers and/or vertical drapes such as sheets of plastic or air-permeable cloth (e.g., burlap or canvas) prior to removal activities to capture falling debris. Floating barges may be deployed in watercourses to capture falling debris, such as paint flakes and dust.
- 16.6. Waste materials collected during removal and application of protective coating operations (e.g., blasting abrasives, paint particles, rust and grease) should be collected and retained for disposal at appropriate locations. Waste materials must not be deposited into watercourses or riparian areas.
- 16.7. Use hydro blasting or manual techniques, where possible, when removing road dirt, soluble salts and loose paint to minimize impacts to the watercourse.
- 16.8. Use water without cleaning agent additives if grease film removal is necessary.



- 16.9. Avoid use of toxic liquid paints, primers, solvents, degreasers and rust inhibitors.
- 16.10. Minimize spill potential by storing, mixing and transferring paints and solvents on land.

17. Helicopter Operations

- 17.1. Safety is the primary objective during all helicopter operations.
- 17.2. All helicopter activity requires a Restricted Activity Permit from the LAO prior to commencement of work.
- 17.3. Helicopter fueling is permitted only at the fueling station of the Operations Compound.
- 17.4. All fuel drums require secondary containment during storage.
- 17.5. The Prime Contractor is responsible for ensuring that a Spill Response Plan for fuelling and fuel drum storage is developed prior to start of work, as stated in the Emergency Response Plan Module.
- 17.6. Helicopter operations must not occur within areas of exposed soils where rotor wash will disturb soils or vegetation.
- 17.7. Helicopter operations are not to occur within 100 m of sighted wildlife, raptor nests or any sensitive features, as designated in the Sensitive Features Table.



References and Source Documents

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Appendix 1 Regulatory Guidance

Jurisdictions

While all projects on lands managed by Parks Canada must adhere to Federal law and regulation, it is considered best practice to refer to local community, regional, provincial regulation and best practices where federal guidance is silent and/or attempt to meet those targets if it can reduce the overall impact of the project.

Some of the project activities reviewed have potential environmental impacts that are addressed by various provincial, federal and territorial acts and regulations. All activities must meet current environmental law and regulations in their design and construction. The following is a brief description of some of the key federal acts and regulations. Further review, understanding and application of other federal, provincial and territorial environmental laws are part of a rigorous approach to project planning and execution.

Canada National Parks Act and Regulations-Parks Canada

All work inside National Parks and Protected Areas must be performed in accordance with the laws and regulations set out in the *Canada National Parks Act and Regulations*. This includes the requirement for most activities described to only be done under a permit such as: business licence for contractor, disturbance of natural objects, travel in restricted areas, special events or use of disposal sites.

Fisheries Act - Fisheries and Oceans Canada

If a project is to be conducted near water, it is the proponent's responsibility to ensure they avoid causing serious harm to fish in compliance with the *Fisheries Act*. The advice in on the Fisheries and Oceans website will help a proponent avoid causing harm and comply with the Act.

If the water body in the project area has fish or is connected to waters at any time that have fish the project must meet the self-assessment criteria on the Fisheries and Oceans website, if not a project review can be made by Fisheries and Oceans Canada to assess whether the project requires authorization or authorization can be requested directly. Given the level of detail required for a review and/or authorization request the EIA officer may need to consider a more involved EIA pathway in those circumstances.

Migratory Bird Convention Act – Environment Canada

The purpose of this Act is to implement the Convention by protecting and conserving migratory birds - as populations and individual birds - and their nests. Section 6 - prohibits the disturbance, destruction, or taking of a nest, egg, or nest shelter of a migratory bird.

In Canada, the general nesting period may start as early as mid-March and may extend until end of August. This is a general nesting period that covers most federally protected migratory bird species. This period varies regionally across Canada mainly due to differences in species assemblages, climate, elevation and habitat type. Generally, the nesting period is delayed in more northerly latitudes, corresponding to vegetation development and food availability. (Environment Canada, 2014). To help with determining regionally relevant periods where nesting is likely to occur, Environment Canada is publishing estimated regional nesting periods within large geographical areas across Canada referred as "nesting zones". These periods are



estimated for each zone and consider the time of first egg-laying until the young have naturally left the vicinity of the nest. Field Units may wish to refine this section and add their known local nesting periods.

Species at Risk Act

If a species listed under the *Species at Risk Act* (SARA) is found within the project area, any potential adverse effects from the proposed project to the individuals of the species, their residences and/or their critical habitat must be understood. Species at risk considerations require specific expertise, due to additional legal requirements under the SARA and CEAA 2012. If the projects or activities to be addressed by the BMP could affect a listed species or its critical habitat, the EIA officer may need to consider a more involved EIA pathway in those circumstances.



Appendix 2 Recommended Seed Mixes for WLNP

All commercial seed lots will have Certificates of Analysis for weed and undesirable species content and germination tests for each lot of each species in the mix.

Prior to seed purchase, certificates of seed analysis will be provided to the Vegetation Ecologist for approval.

Do NOT purchase seed until written approval for individual lots is obtained.

Certificates of Analysis must include both the common and scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier will be included.

Percentage of individual species within mixes are approximate and may vary depending on seed availability. A number of native species that are available only in limited quantities commercially have been included in the seed mixes. These seed mixes are to be used as possible conditional on availability of individual species; modifications/replacements are allowed, subject to approval by the WLNP Vegetation Ecologist.

Native seed mixes will be seeded within the appropriate areas of WLNP (i.e., open fescue prairie, open deciduous forests with or without a mesic area modifier, etc.).

Inclusion of a clean cover crop (e.g., awned wheatgrass), to combat invasive plant problems may be considered.

Below is an **example** seed mix. Consult with Vegetation Ecologist for ALL projects, regardless of size, for a site specific and project appropriate mix.

Seed Mix	Species	Species % by Seed Weight
Open Fescue Grassland Mix Rate = 40 kg/ha	Foothills rough fescue (<i>Festuca campestris</i>)	40
	Idaho fescue (<i>Festuca idahoensis</i>)	20
	Parry Oatgrass (<i>Danthonia parryi</i>)	10
	Bluebunch wheatgrass (<i>Agropyron spicatum</i>)	10
	June grass (<i>Koeleria macrantha</i>)	7
	Alkaline bluegrass (<i>Poa juncifolia</i>)	3
	Rocky Mountain fescue (<i>Festuca saximontana</i>)	3
	Sticky Purple Geranium (<i>Geranium viscosissimum</i>)	3
	Early Yellow Locoweed (<i>Oxytropis sericea</i>)	3
	Yarrow (<i>Achillea millefolium</i>)	1
Aspen / Shrub Community Mix Rate = 40 kg/ha	Smooth wild rye (<i>Elymus glaucus</i>) ¹	25
	Bluebunch wheatgrass (<i>Agropyron spicatum</i>) ¹	20
	Foothills rough fescue (<i>Festuca campestris</i>) ¹	20
	Idaho fescue (<i>Festuca idahoensis</i>) ¹	15
	Mountain Brome (<i>Bromus carinatus</i>) ^{1&2}	10
	Marsh Reed Grass (<i>Calamagrostis canadensis</i>)	40
	Tufted hair grass (<i>Deschampsia caespitosa</i>) ²	40



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Appendix 2 Recommended Seed Mixes for WLNP

Seed Mix	Species	Species % by Seed Weight
¹ species for dry open stands	Sticky Purple Geranium (<i>Geranium viscosissimum</i>)	2
	Northern bedstraw (<i>Galium boreale</i>)	2
² species for wet or closed stands	Meadow Rue (<i>Thalictrum occidentale</i>)	2
	American vetch (<i>Vicia americana</i>)	2
	wild strawberry (<i>Fragaria virginiana</i>)	2