

Parks Canada Agency

Jasper National Park

**Category 4-6 Asphalt Roadways & Parking
Lot Maintenance**

5P420-22-0019

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STATEMENT OF WORK

SECTION 2 – GENERAL CONDITIONS

2. DESCRIPTION OF WORK

Work under this Contract comprises the furnishing of all labour, materials, equipment, tools, supervision and transportation necessary to repair hot mixed asphaltic concrete surfaced roads and parking areas (the 'Project') in Jasper National Park (JNP).

Roads, campgrounds, and parking lots (the 'Sites') covered in this Scope of Work are part of Jasper National Park (JNP), which is part of the Jasper Field Unit for Parks Canada Agency (PCA). The Sites are located at various locations throughout JNP as well as Jasper town site.

- General Scope of Work under this Contract includes the following, but is not limited to:
- Asphalt removal to various depths,
- Excavation of granular materials, to various depths, where paved surfaces are showing base failure,
- Installation, grading, and compaction of granular materials,
- Paving up to 100 mm thickness,
- Overlaying areas designated by the Parks Canada Representative (PCR) with hot mix asphaltic concrete,
- Re-instating pavement markings that are obliterated through activities in Scope of Work,
- Sealing of pavement cracks identified by the PCR,
- Repairing areas designated by the PCR,
- Adjusting manholes, catch basins and valves designated by the PCR,
- Supplying and installing catch basins frame and lids,
- Supplying and installing or reinstating culverts, and
- Arranging work schedules with the PCR.

Areas within the Scope of Work include any Day Use Areas ('DUA'), pullouts, parking lots, or other paved locations, in addition to the roadways proper.

The Contractor will be required to complete the works as directed and as marked in the field by the PCR. The type of work required will generally follow the estimated yearly usage, however it is noted that there will be no unit rate adjustments for quantity variations. The actual location of the roadway, parking lot, or campground may be at any location within JNP as summarized, but not limited to, the tables in Section 2.1, 2.2, and 2.3. Detailed locations requiring repair or maintenance will be provided to the Contractor each year by PCR prior to commencement of Work, through the issuance of at least one (1) Task Authorization (TA) to be completed in spring and potential for another TA during the fall or the year. A generalized location map is included in Appendix A but should not be assumed to be a complete representation of the all items that may be included within the Scope of Work.

2.1. ROADWAYS

Roadways	Approximate Length (km)
Maligne Lake Road	43.5
Sixth Bridge Road	1.7
Fifth Bridge Road	0.8
Highway 93A	25.5
Cavell Road	14.0
Marmot Road	11.8
Pyramid Lake Road	7.5
Patricia Lake Road	0.6
Miette Road	16.8
Old Fort Point Road	0.9
Snaring Road	6.1
Palisades Road	0.9
Skytram Road	3.9
Jasper Park Lodge Road	2.7
Lake Edith Road	3.6
Lake Annette Road	1.8
Transfer Station Road	0.6
Cottonwood Road	0.4
Maintenance Compound Road	0.9
Total Length (km):	144

2.2. CAMPGROUNDS ROADS AND APPURTANCES

Campgrounds	Approximate Length (km)
Pocahontas	2.93
Whistlers	22.05
Wapiti	7.47
Wabasso	5.22
Snaring	2.25
Wilcox	3.34
Honeymoon	0.85
Kerkeslin	1.06
Jonas	0.43
Total Length (km):	45.6

2.3. PARKING LOTS

Parking Lots	Approximate Area (m ²)
Town of Jasper Parking Lots	
Heritage Train Station (West Lot)	6564
Heritage Train Station (Via)	2725
Heritage Train Station (Bus Lot)	2430
Highway 16 East	
Jasper Lake	3770
Maligne Lake Road	
Sixth Bridge	1581
Fifth Bridge	1300
Skyline Trailhead	305
Maligne Overlook	933
Maligne Canyon	3202
Maligne Upper	13148
Maligne Middle	10538
Maligne Lower	5486
Maligne Boat Launch	6985
Icefields Parkway (Hwy 93)	
Valley of the Five	8198
Athabasca Falls	12587
Sunwapta Falls	4116
Icefields Centre	3800
Highway 93A	
Cavell Road Junction	1260
Meeting of the Waters	539
Geraldine Fire Road Junction	10627
Cavell Road	
Cavell	3447
Pyramid Lake Road	

Parking Lots	Approximate Area (m²)
Cottonwood Slough	867
Stables Road	1532
Patricia Lake Road	
Patricia Lake	719
Pyramid Beach Picnic	569
Pyramid Lake	815
Pyramid Island	279
Palisades Trailhead	530
Miette Road	
Hot Springs	5956
Old Fort Point Road	
Lac Beauvert	167
Lake Annette Road	
Lake Annette	3677.82
Maintenance Compound Road	
Maintenance Compound	1128
Total Area (m²):	116,104

2.4. COMPLETION OF WORKS

Year 1: Required Services

The Contractor must have the availability and capacity to complete all 2022 paving activities by October 30, 2022:

2022 paving activities are expected to include the following locations:

*Note: All approximate areas and lengths of stated locations can be found in Annex "A" – Statement of Work Section 2.1 – 2.3

- Sunwapta Falls Parking Lot and Access Road
- Maligne Road, including:
 - Maligne Canyon Parking Lot
 - Lower Maligne Parking Lot
 - Jasper Park Lodge Road
- Pyramid Lake Road
- Highway 93A, including:
 - Marmot Road

- Wabasso Campground
- Wapiti Campground
- Cottonwood Road

All work must be completed as per Annex "A" – Statement of Work and the applicable Appendices.

2.4.1 Option Years

Year 2 and 3 (at discretion of Parks Canada Agency):

TAs shall be completed within a reasonable time frame as mutually agreed by the PCR and Contractor at the time of TA and as stated on the completed TA form PWGSC - TPSGC 572.

The Contractor is advised that there may be one (1) TA per year.

Initial Authorization; PCA may issue TAs between May 1 and October 30.

2.5. WORK RESTRICTIONS

2.5.1. HOURS OF OPERATION

Hours of Operation: 0700 – 1900, Monday to Sunday, during daylight working hours. No Work is permitted on Civic or Statutory Holidays, or long weekends including one day prior and one day post the long weekend. No work shall be allowed outside normal working hours unless prior written approval is granted by PCR. No approval will be granted for Work outside of daylight hours.

Contractor is cautioned that traffic volumes are usually higher on Friday, Saturday and Sunday.

2.5.2. USE OF THE WORK SITE

Sites will be made available by PCA to the Contractor for its non-exclusive use for the duration of the Work.

The Contractor must:

- Limit use of premises for Work, storage, and access, to allow PCA occupancy, as well as co-ordinate use of premises under direction of PC,
- Keep Sites clean and free from accumulation of waste materials and rubbish regardless of source,
- Provide sanitary facilities for work force in accordance with governing regulations and the Environmental Procedures for this Project,
- Provide traffic control, inclusive of pedestrian and vehicular traffic, for the duration of the Work as part of a Traffic Accommodation Strategy,
- Maintain, at a minimum, one-way traffic on all roadways with flag people during all operations. Lane closures must be detailed in the Traffic Accommodation Strategy and approved by PCR,
- if considered a requirement, operate asphalt plan in manor deemed acceptable to PCR and Environmental Surveillance Officer (ESO) within the designated area, to be determined,
- Repair any damage to Sites caused by Contractors activities at the expense of the Contractor,
- Assume full responsibility for protection and safekeeping of Sites and products. Contractor must restore all Sites to equal, or better than, conditions than that which existed prior to commencement of Work following completion of operations,
- Follow all environmental conditions and mitigations measures identified; and
- Give precedence to health and safety of the public, site personnel and protection of the environment over cost and schedule considerations for Work.

Contractor is to provide their own accommodation. Camping is not permitted on Sites. Potentially a Parks Canada Work Camp (WC), up to 5 spots, will be available for this Contract upon request by the Contractor. Parks Canada Work Camp regulations are attached Appendix C.

Contractor's potential use of WC:

- Contractor can reserve use of individual WC spaces, at a cost of \$30.75 plus GST per space,
- Each WC space can accommodate up to a Class A motor home plus vehicles as per terms of use,
- The WC is located at the intersection of Sleepy Hollow Road and Connaught Drive in Jasper, AB,

- Coordinate use of WC under direction of PCR. Use of the WC is allowed until the Contract Termination, or earlier as directed by PCA,
- The WC must not be used for additional storage, preparation of Work, or as a Work area for operations under this Contract. No storage or use of equipment, construction materials or machinery is allowed,
- All Contractor's business and private vehicles are required to display a vehicle Work pass from PCA. These permits may be obtained free of charge from PCA Environmental Surveillance Officer or as directed by PCR; and
- Use of the WC must conform to the requirements and conditions at the time of camping permit issuance.

2.5.3. PUBLIC AREAS

Construction operations must be conducted so as to cause minimal inconvenience to the public and to owners of adjoining property. Existing access to property must be maintained as far as possible. If new access is required, Contractor must insure new access is functional prior to the existing access being removed.

Steel tracked equipment with cleats will not be allowed on pavement designated for future use. Asphalt, granular, embankment and excavation materials may be hauled on existing highway, but this shall be by standard highway trucks not exceeding legal highway load limits.

The Contractor must ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Sites and entering public roadways must be cleaned of mud and dirt clinging to the body and wheels of the vehicle.

All vehicles transporting materials or equipment to Sites, must be (un)loaded in a manner which will prevent deposition of materials or debris on roadways. In instances where contents, or debris, may be blown off during transit, such loads must be covered by tarpaulins or other suitable covers. All spills must be removed and cleaned immediately at Contractors expense and to satisfaction of PCR as per Section 2.9.6

2.5.4. UTILITIES

The Contractor must become familiar with all utilities and services adjacent to the Work and is responsible for any and all cost of repairs resulting from damage due to Contractors operations. It is the full responsibility of the Contractor to identify any conflicts or impacts with existing utilities and to provide mitigation as required at no additional cost to PCA.

The Contractor must establish and maintain direct and continuous contact with the owners of any utilities which may interfere with the Work. The Contractor must co-operate with utility owners at all times and in all places of Work. The Contractor must keep PCR informed of all communications with utility companies and authorities.

The Contractor must notify PCR and the utility companies at least seven days in advance of any activities which may interfere with the operation of such utilities. The Contractor shall assess the possible impact of its operations on all utilities that may be affected by its operations, and shall, in consultation with utility owner(s), protect, divert, temporarily support, relocate, or otherwise appropriately treat such utilities to ensure that they are preserved.

The Contractor must immediately report any damages to utilities, caused by Contractors activities, to PCR and to the utility company or authority affected. Contractor must promptly undertake any and all remedial measures as necessary at no additional cost to the PCA.

2.5.5. RELICS AND ANTIQUITIES

Relics, antiquities and items of historical or scientific interest, such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found on Sites, remain property of the PCA. Protect items by noting locations and leaving items undisturbed. Request directives from PCR if items are identified within Work areas.

Notify PCR and stop Work in the affected area immediately if evidence of archaeological finds is encountered and await the PCR's written instructions prior to proceeding with Work in affected area.

2.6. MEASUREMENT AND PAYMENT

2.6.1. MEASUREMENT

For each unit price item, payment is based on measured field quantities provided by the Contractor and verified by PCR. PCR will validate payment based on quantities provided by Contractor and in comparison with estimated quantities identified in Task Authorization, tendered unit price and PCR's agreement of the determination and value of units of Work completed. Method of measurement to be used is listed herein and may be detailed in the section of the specification covering each Work item.

2.6.2. INVOICES

Submit invoices to PCR within ten (10) working days of completion of Work and once quantity measurements have been confirmed and agreed on with PCR. Where the duration of Work identified is greater than 30 days, the Contractor may submit monthly progress claims, and shall be entitled to receive progress payments at monthly or other agreed upon intervals. Supply documentation to PCR in support of invoices including agreed on field book measurements and quantities.

Payments in respect of the agreed price shall be made upon satisfactory performance of the Work, and upon approval of the PCR, but such payments shall not exceed the amount(s) as specified in each Task Authorization, for the Work without written authorization.

2.6.3. AMENDMENTS

Immediately notify PCR of any irregularities encountered in the Work or discrepancies between quantities identified in Task Authorization and field measurements. Do not proceed with affected Work until authorized to do so by the issuance of an Amendment. Make no change in the Work unless an Amendment is issued or modification to Work is approved, in writing, by PCR.

2.7. PROJECT MANAGING & COORDINATION

2.7.1. PROJECT MEETINGS

Attend pre-construction, seasonal shutdown, start-up, and any other milestone meetings as and when required to coordinate related or affected Work. Contractor to provide information, as determined by PCR.

2.7.2. CONSTRUCTION ORGANIZATION AND START-UP

At the issuance of each Task Authorization and within 14 days of mobilization to JNP, request a meeting with PCR to discuss and determine administrative procedures and responsibilities. Meeting to be chaired by PCR who will also record the minutes of the meeting.

Agenda to include following, but is not limited to:

- Schedule of Work, Schedule of Submittals, and progress scheduling,
- Requirements for temporary facilities, offices, storage sheds, utilities, fences.
- Site safety and security,
- Proposed changes, amendments, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and other requirements,
- Monthly progress claims, invoices, administrative procedures photographs, and holdbacks,
- Close out procedures and submittals,
- Insurances and transcript of policies; and
- Other business.

2.7.3. CONTRACTOR MANAGEMENT

Contractor to:

- Designate foreman as a point of contact for the PCR,
- Comply with PCR's allocation of site mobilization areas, as identified in TA,
- Comply with instructions of the PCR for use of temporary utilities and construction facilities,
- Coordinate field engineering work with the PCR,
- Submit daily work reports to the PCR at each work day end including suppliers weigh tickets and measurements of completed work. Template may be provided to the Contractor with each TA,
 - Allow sufficient time to take and validate measurements for payments by the PCR.
 - Not damage geodetic benchmarks unless authorized by PCR,
 - At all work sites where line painting is affected, the Contractor shall mark accurately, at regular intervals, the location and type of existing painted lines, including start and ends of passing lanes and intersections, with a stake at the side of the roadway and make a written record of markings in a book, in order that painted lines can be accurately re-established after work is completed; and
 - All survey work required by the Contractor to layout, monitor, provide measurements for quantities, submit daily work reports is considered incidental to the completion of the Works and will not be considered for separate payment.

2.7.4. ON-SITE DOCUMENTS

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

- Contract Drawings part of TA and Tender,
- Business Licenses,
- Specifications,
- Addenda,
- Amendments and other modifications to Contract,
- Traffic Accommodation Strategy,
- Safety Plan,
- WHMIS,
- Environmental Protection Plan,
- Field test reports,
- Copy of approved Work schedule and most recent updated schedule,
- Labor conditions and wage schedules; and
- Applicable current editions of municipal regulations and by-laws.

2.7.5. PROJECT SCHEDULE

With each issuance of Task Authorization, the Contractor must prepare a Project Schedule formatted as a detailed bar chart or network diagram showing the proposed schedules of the components of the Work and manpower required to complete each aspect, which must be submitted to PCR one (1) week prior to commencement of any Work.

Project Schedule to include dates excluded from construction (i.e. Statutory of Civic Holidays and long weekend in accordance with Section 2.5.1). PCR will review and approve or return a revised schedule within 3 Working days. Contractor to revise schedule, if required, and resubmit within three (3) working days. Accepted Project Schedule will become Master Plan and be used as the baseline for progress updates.

2.7.6. SUBMITTAL SCHEDULE

With each issuance of Task Authorization, the Contractor must prepare a schedule of the required submissions and the date the submissions will be made. Include columns for Actual Date of Submission, Review Comments Received, Final Submission and Final Acceptance Received. Parks Canada will not be responsible for any construction delays resulting from delays in submission acceptance if the submittal dates shown in the Submittal Schedule are not achieved.

Submittal Schedule will include, but not be limited to, the following:

Pre-Mobilization Submittals:

- A completed "Attestation and Proof of Compliance with Occupational Health and Safety (OHS)" form,
- Proof of applicable Parks Canada and Municipality of Jasper business licenses,
- Project Schedule,
- List of key Contractor personnel, including names, position and telephone numbers,
- Work Plan describing the Contractor's intended methods of Work and projected number of equipment and personnel onsite,
- Laboratory sample results of the materials requiring approval by PCR,
- Quality Control Plan documenting the Contractor's procedures for maintaining the quality of Work as per these specifications. As required, and in consultation with PCR, if

roadways lines are obliterated through this Scope of Work, Plan must include night inspections to verify retro-reflectivity of reinstated lines,

- Quality Control Inspection Program (QCIP),
- Traffic Accommodation Strategy in accordance with this document,
- Copy of Contractor's Health and Safety Plan,
- Emergency Response Protocol, documenting Contractors` procedures for handling emergencies,
- Environmental Plan including Spill Response Plan, and
- Hazardous Materials Management Plan.

Project Submittals:

- Asphalt Mix Design,
- Quality Control Inspection Reports,
- Daily Work Reports identifying quantities used under each Contract Unit Price Item. This report shall be sent to the PCR daily,
- Physical copies of Weigh Tickets for backfill and asphalt delivered to work site shall be submitted daily to the PCR, and
-

Project Completion Submittal:

- Quality Control Records, and
- Summary Record of Works completed and date accepted by PCR.

2.7.7. FIELD ENGINEERING

Maintain an accurate log of any changes in the field. Record offset of all unit pricing item Work completed for historical record of Work completed.

2.7.8. CONSTRUCTION PROGRESS MEETINGS

During course of Work prior to Project completion, PCR will schedule progress meeting on an as and when required basis. Contractor, major Sub-contractors and PCR are to be in attendance. Meeting to be chaired by PCR who will record the minutes of the meeting.

Agenda to include following, but not be limited to:

- Review, approval of minutes of previous meeting,
- Review environmental issues,
- Review Traffic Control and Emergency Response Protocol issues,
- Review site safety and security issues,
- Review of progress since previous meeting,
- Discuss field observations, problems, and conflicts,
- Review submittal schedules: expedite as required,
- Corrective measures and procedures to regain projected schedule,
- Revisions to construction schedule,
- Review Progress schedule, during succeeding Work period,
- Review of quality reports since previous meeting,
- Review construction budget: payments, variances from Contract; and
- Other business.

2.7.9. INSPECTIONS

All Work and materials covered by this Statement of Work are subject to inspection at any time by PCR. PCR shall conduct inspections on a regular basis or upon Contractor's request. The Contractor must accompany PCR during inspections to formalize agreement on completed and finalized Work, note deficiencies, discrepancies and any need to rectify Work.

2.7.10. CLOSEOUT PROCEDURES

Comply with the PCR's instructions for correction of items of Work listed during inspections and notify the PCR of completion of these items.

2.8. HEALTH & SAFETY REQUIREMENTS

2.8.1. SUBMITTALS

For each TA, the Contractor to submit site specific Health and Safety Plan, 7 days prior to commencement of Work. Health and Safety Plan must include, but is not limited to, the following:

- Results of site-specific safety hazard assessment,
- Results of safety and health risk or hazard analysis for site tasks and operation,
- Copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors; and
- Submit copies of incident and accident reports, as well as WHMIS MSDS - Material Safety Data Sheets.

PCR may respond in writing, where deficiencies or concerns are noted and may request re submission with correction of deficiencies or concerns. PCR's review of the Contractor's Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for Health and Safety during the Work.

Submit, and make available to all workers at each Site, the emergency numbers for police, fire and ambulance as well as the names and after-hours numbers for key site personnel related to health, safety or security of the Site.

Notify Jasper Emergency Services (including EMS, Fire, and RCMP) prior to commencing Work.

2.8.2. MEETINGS

With each issuance of TA, a pre-construction meeting to include a Health and Safety meeting with PCR prior to the commencement of Work. The Contractor will also arrange for daily tailgate safety meetings and submit the reports to PCR on a weekly basis.

2.8.3. REQUIREMENTS

With each issuance of Task Authorization, Contractor to 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.

Contractor is responsible for health and safety of persons on site, safety and security of property on site, for protection of persons adjacent to site and the safety of surrounding environment to the extent that they may be affected by Contractor activities in completing the Work.

Contractor is responsible for complying with and enforcing compliance of employees with the safety requirements within the Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site specific Health and Safety Plan. Ensure

applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province Alberta having jurisdiction, and in consultation with PCR.

Contractor to immediately address health and safety non-compliance issues identified by authority having jurisdiction or by PCR. Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations.

Provide PCR with written report of action taken to correct non-compliance of health and safety issues identified. PCR may stop Work if non-compliance of health and safety regulations is not corrected.

2.8.4. UNFORESEEN HAZARDS

When unforeseen or peculiar safety related factors, hazards, or conditions occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province Alberta and advise the PCR verbally and in writing.

2.8.5. HEALTH & SAFETY COORDINATOR

With each issuance of TA, the Contractor is to employ and assign a competent and authorized representative to fulfill the role as Health and Safety Coordinator. The supervisor or foreman may satisfy the role of Health and Safety Coordinator.

Health and Safety Coordinator must:

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

2.9. ENVIRONMENTAL PROCEDURES

2.9.1. PAYMENT

With each issuance of Task Authorization, the Contractor must describe environmental mitigation measures they will implement to ensure that all Work is in compliance with this Section. The cost of environmental and aesthetic protection is incidental to the Work.

2.9.2. CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)

Execution of the Work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA) Guidelines [latest edition], the Impact Assessment in Canada (IAA 2020) provisions, and any subsequent amendments.

Failure to comply with or observe environmental protection measures as identified in these specifications may result in the Work being suspended pending rectification of the problems.

2.9.3. STARTUP AND ENVIRONMENTAL BRIEFING

With each issuance of TA, all staff employed at the construction site will be subject to an approximately half hour briefing regarding their individual and collective responsibilities to ensure avoidable adverse environmental impacts do not arise from their activities and personal choices. Employees must attend this briefing before beginning their Work at the Site. It is recognized new employees may join the Contractors' Work force after the initial round of Environmental Briefing. In that case and as required, subsequent Environmental Briefings can be presented as numbers warrant, by arrangement with the ESO through the PCR. Also, some sub-trades may be present at the site for a short time, to perform once-only duties. In these cases, the Environmental Briefing will be replaced by the Contractor explaining the environmental sensitivity of the Work location to the sub-trade worker(s), and reviewing highlights of the personal conduct expected, with reference to a one-page briefing summary to be provided to the Contractor by the ESO. A copy of this summary will be provided to each sub-trade worker joining the work force at the site.

Parks Canada will have an ESO attending the site to monitor the construction activity for conformance with these specifications. The ESO or alternate designated Parks Canada staff member will present the Environmental Briefing. The ESO's main duties are to monitor the progress of the construction on an on-going basis to ensure compliance with environmental protection measures, and to provide guidance through PCR, in the event of unanticipated environmental problems. Although the ESO has authority to enforce National Parks Act violations, direction to the Contractor will be the duty of PCR.

2.9.4. CONSTRUCTION SITE ACCESS AND PARKING

With each issuance of TA, the Contractor must review both short and long term construction access requirements with PCR, both at start-up and on an ongoing basis. In consultation with PCR, the Contractor must formulate an agreement for worker transportation to and from the Sites and where workers must park their private vehicles.

Generally, personal vehicles must be parked at least 10 metres distance from any watercourse.

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

Parking will only be allowed on the hardened, paved surfaces. No parking on the vegetated areas.

2.9.5. PROTECTION OF WORK LIMITS

The Contractor must ensure that workers and equipment do not trespass outside the project limits to the satisfaction of PCR and the ESO.

2.9.6. POLLUTION CONTROL

The Contractor must prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Generally, hazardous or toxic products must be stored no closer than one hundred (100) metres from water.

A Spill Response Plan will be prepared by the Contractor and must detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products, to the satisfaction of the PCR and ESO and in accordance with all applicable federal and provincial legislation. The Plan must include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous or toxic to the environment.

The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products must be in accordance with all applicable federal and provincial legislation.

An impervious berm must be constructed around fuel tanks and any other potential spill area.

The berms must be capable of holding 110% of tank storage volumes and must be to the satisfaction of PCR and the ESO before start-up. Measures such as collection/drip trays and berms lined with occlusive material such as plastic and a layer of sand, and double-lined fuel tanks can prevent spills into the environment.

The Contractor must provide spill kits at re-fueling, lubrication, and repair locations that will be capable of dealing with 110% of the largest potential spill and must be maintained in good Working order on the construction site. The ESO and PCR prior to Project start-up must approve these spill kits. The Contractor and site staff must be informed of the location of the spill response kit(s) and be trained in its use.

Timely and effective action must be taken to stop, contain and clean-up all spills as long as the site is safe to enter. PCR and the ESO must be notified immediately of any spill. In the event of a major spill, all other Work must be stopped, and all personnel devoted to spill containment and clean-up.

The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of PCR and ESO.

2.9.7. EQUIPMENT MAINTENANCE, FUELING, AND OPERATION

With each issuance of Task Authorization, the Contractor must ensure that all soil, seeds and any debris attached to construction equipment to be used at the Sites must be removed (e.g. power washing) outside the National Parks before delivery to the Work site. All equipment must be inspected by ESO prior off-loading on site.

Equipment fueling sites will be identified by the Contractor and approved by PCR and the ESO. Any fueling closer than 50 metres from streams, wetlands, water bodies or waterways must require the authorization of PCR. Machinery and equipment, including chainsaws, must be stored, maintained, and fueled on a flat surface, outside of the dripline of trees.

Diesel and gasoline delivery vehicles, including bulk tankers must be parked more than 100 metres from streams, wetlands, water bodies or waterways. Gravity fed fuel systems are not allowed. Manual or electric pump delivery systems must be used. Fueling personnel must maintain presence at and their immediate attention to the fueling operation.

Mobile fuel containers (e.g. slip tanks, small fuel carboys) must remain in the service vehicle at all times.

Equipment used on the Project must be fueled with E10 and low Sulphur diesel fuels and must conform to local emission requirements. The Contractor is to ensure that unnecessary idling of vehicles is avoided.

Oil changes, lubricant changes, greasing and machinery repairs must be performed at locations approved by the ESO or PCR. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) must be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. anywhere within National Parks.

The Contractor must ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good Working order.

Fuel containers and lubricant products must be stored only in secure locations specified by PCR. Fuel tanks or other potentially deleterious substance containers must be secured to ensure they are tamperproof and cannot be drained by vandals when left overnight in National Parks. Alternatively, the Contractor may hire a security person employed to prevent vandalism. The Contractor is to ensure that workers are briefed on proper 'daisy-chain' use of locks to ensure no other Contractor or PCA is locked out.

2.9.8. OPERATION OF EQUIPMENT

Equipment movements must be restricted to the 'footprint' of the construction area identified for each year of Work. The Work limits must be identified by stake and ribbon or other methods approved by PCR. Unless authorized by PCR, activities beyond the Work limits are not permitted. No machinery will enter, Work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities. If some of the construction will require Working close to creeks and other watercourses or water bodies, the Contractor is to describe measures to be employed to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) do not enter any watercourses, to the satisfaction of PCR and ESO.

The Contractor must instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the vegetated areas bordering the right-of-way or into watercourses or water bodies.

When, in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated Work area, the Contractor will be responsible, at their expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of PCR and ESO.

Restrict vehicle movements to Work limits. Workers private vehicles are to remain within the construction footprint.

2.9.9. FIRE PREVENTION AND CONTROL

At a minimum, a fire extinguisher must be carried and available for use on each machine in the event of fire. However; basic firefighting equipment is recommended (e.g. a water truck; minimum 500 Imperial gallons with 500 feet of fire hose and a pump capable of producing 45 psi water pressure at the nozzle, three shovels, two pulaskis and two five-gallon backpack pumps) to be maintained at the Sites in a location known and easily accessible to all the Contractors' staff.

A water truck may be necessary and will depend on the timing of the Contract (e.g. – not required during winter or snow covered conditions).

Construction equipment must be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.

Care must be taken while smoking on Sites to ensure that the accidental ignition of any flammable material is prevented. Fires or burning of waste materials is not permitted.

In case of fire, the Contractor must take immediate action to extinguish the fire provided it is safe to do so. The ESO and PCR must be notified of any fire immediately.

2.9.10. WILDLIFE

During the Environmental Briefing all personnel will be instructed by the ESO on procedures to follow in the event of wildlife appearance near or within the Sites and any other wildlife concerns.

Avoid or terminate activities on Sites that attract or disturb wildlife and vacate the area and stay away from the immediate location if bears, cougars, wolves, elk or moose display aggressive behaviour or persistent intrusion. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times.

Notify the ESO and PCR immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the Sites or crew accommodation. Other wildlife-related encounters are to be reported within 24 hours.

2.9.11. WASTE MATERIALS STORAGE AND REMOVAL

The Contractor shall dispose of hazardous wastes in conformance with the Environmental Contaminants Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.

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

Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in JNP. These wastes shall be contained and removed in a timely and approved manner by the Contractor and disposed of at an appropriate waste landfill sites located outside the park. Construction waste storage containers, provided by the Contractor, shall be emptied by the Contractor when 90% full.

Waste containers will have lids, and waste loads shall be covered while being transported.

A concerted effort shall be made by the Contractor to reduce, reuse and recycle materials.

All efforts to prevent wildlife from obtaining food, garbage or other domestic wastes shall be made by the Contractor while undertaking their Work in JNP. Such wildlife attractants shall not be stored at the Work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily removal of food scraps, food wrappers, pop cans or other attractive products, to bear proof containers is mandatory. It is incumbent on the Contractor to notify PCA and make specific arrangements to have garbage collected by PCA when using existing PCA receptacles.

The Contractor shall immediately report any circumstances related to food/garbage (e.g. overflowing container or strong smell) and wildlife to the ESO or PCR.

Sanitary facilities, such as portable container toilets, shall be provided by the Contractor, as required, and maintained in a clean sanitary condition. These facilities must not be used for the disposal of anything but human body wastes.

2.9.12. EROSION CONTROL AND SEDIMENTATION

The Contractor shall communicate their intended Erosion and Sedimentation Control (ESC) mitigation measures, for the implementation of sediment control devices for Work that is undertaken in proximity to watercourses, wetlands or riparian environments. The Works should include the installation and maintenance of sediment control devices like silt fence, wattles, or other approved devices to ensure the elimination of releases into sensitive areas. These measures shall be reviewed and revised to the satisfaction of the PCR.

Preparation and implementation of the ESC measures including all labour, equipment and materials necessary to complete the work will be considered incidental to the Work and no separate or additional payment will be made.

2.9.13. NON-NATIVE VEGETATION

At each TA, upon mobilization to Jasper National Park, all equipment must be steam cleaned or pressure washed and inspected prior to entering the Park.

2.9.14. WATERWAYS

All components of the Work must be conducted without equipment entering into wetlands, water bodies, streams and rivers.

Road repairs and paving within 30 metres of waterbodies, including various stream crossings, must have direct oversight by PCR. The Contractor will be required to include erosion and sedimentation controls when working within a 30 metre buffer on each side of the water course.

All waste materials from the Work must be contained and collected in a manner to prevent any contact with the river valleys and waterways. All collected waste materials must be disposed of in accordance with specifications.

2.9.15. MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES

The Contractor must ensure trespass outside the Project limits does not occur, to the satisfaction of PCR and ESO. No Camp will be allowed within JNP.

The National Park Act regulations prohibit anyone working within National Parks from using public campground and day use area facilities.

Pets must not be brought to or maintained at the construction site.

2.10. REGULATORY REQUIREMENTS

2.10.1. REFERENCES AND CODES

Perform Work in accordance with the codes, regulations, standards, amendments issued up until the Tender closing date and all other codes issued by provincial or local authority. In case of conflict or discrepancy within the list below, the more stringent requirement shall apply:

- Species at Risk Act,
- Migratory Bird Convention Act,
- Canadian Transportation Agency,
- Alberta Transportation,
- Alberta Infrastructure,
- Alberta Energy,
- Alberta Environment,
- Fisheries and Oceans Canada,

- Navigation Protection Act,
- Environment Canada,
- Municipal Utilities, and
- Occupational Health and Safety.

Contractor must meet or exceed requirements of:

- Contract documents, and
- Specified standards, codes and referenced documents.

2.10.2. COMPLIANCE WITH REGULATIONS

Ascertain requirements and regulations listed above. Comply with all such requirements and regulations as applicable to the Work. Requirements set out in this section are for guidance and information, the list is not necessarily complete.

2.10.3. PERMITS

Each year of this Contract, obtain all required construction permits including but not limited to:

- Parks Canada Business License,
- Restricted Activity (Special Activity) Permit, and
- Municipality of Jasper Business license when Working in the Jasper town site.

2.10.4. NATIONAL PARKS ACT

The Contractor must ensure that all Work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.

2.11. CONSTRUCTION FACILITIES

All Work associated with this item is considered incidental to the Work.

2.11.1. INSTALLATION AND REMOVAL

The Contractor shall be allowed to store equipment and materials used for this Contract and carry out minor maintenance Work at various locations throughout JNP. The list of available locations will be provided by PCR at the time of TA issuance.

Certain conditions may apply for the Contractor to use these facilities prior to the start of Work each year; therefore, the Contractor must prepare a Site Plan indicating proposed location and dimensions of area to be fenced and used by Contractor, avenues of ingress/egress to fenced area and details of fence installation. Indicate use of supplemental or other staging area. Provide construction facilities in order to execute Work expeditiously and remove from Site all such Work after use. This plan must be submitted for approval by PCR. PCA is not responsible for any material or equipment stored on PCA property.

Each year of the Contract, the Contractor will be responsible for the timely and proper cleanup of waste or spilled material, and the timely and proper disposal of containers as directed by PCR.

2.11.2. SITE STORAGE / LOADING

Confine Work and operations of employees in accordance with Contract Documents. Do not unreasonably encumber premises with products. Do not load or permit to load any part of Work with weight or force that will endanger Work.

2.11.3. EQUIPMENT, TOOL, AND MATERIALS STORAGE

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

2.12. CLEANING

2.12.1. PAYMENT

All Work associated with this item is considered incidental to the Work.

2.12.2. PROJECT CLEANLINESS

Maintain Work in tidy condition, free from accumulation of waste products and debris. Remove waste materials from Site on regular daily intervals. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of all waste and debris outside of the JNP.

If the Contractor is negligent in maintaining cleanliness on Sites, site roads, access roads or public roads, or other areas where construction vehicles are travelling, PCR will arrange for cleaning to be completed at Contractor's expense. The costs will be subtracted from final payment.

Use only cleaning materials recommended by the manufacturer of the surface to be cleaned, and as recommended by cleaning the material manufacturer.

When Work is Substantially Complete remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work. Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy. Prior to final review remove surplus products, tools, construction machinery and equipment.

2.13. CONSTRUCTION DEMOLITION, WASTE MANAGEMENT AND DISPOSALS

2.13.1. PAYMENT

All Work associated with this item is considered incidental to the Work.

2.13.2. WASTE PROCESSING SITES

All waste, dumping and debris sites to be determined by Contractor and subject to approval by the PCR.

Excavated material that is clean but deemed unsuitable for backfill can be hauled to Marmot Pit upon approval of the PCR and through application by the Contractor.

No waste will be allowed at the Jasper Transfer Station.

2.13.3. STORAGE, HANDLING AND PROTECTION

Store, materials to be reused, recycled and salvaged in locations to be determined by Contractor and subject to approval by PCR. Protect, stockpile, store and catalogue salvaged items. Separate non salvageable materials from salvaged items. Transport and deliver non salvageable items to licensed disposal facility.

2.13.4. DISPOSAL OF WASTES

Do not bury rubbish or waste materials. Burning of rubbish or waste materials is not permitted. Haul waste offsite and outside of national parks.

2.14. HAZARDOUS MATERIAL

2.14.1. PAYMENT

All Work associated with this item is considered incidental to the Work.

2.14.2. DEFINITIONS

Dangerous Goods: Product, substance, or organism that is specifically listed or meets the hazard criteria established in Transportation of Dangerous Goods Regulations.

Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

Hazardous Waste: Any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and Workers information about hazardous materials used in the Workplace.

Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and Worker education programs. WHMIS is put into effect by a combination of federal and provincial laws.

2.14.3. SUBMITTALS

Submit to PCR current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

Submit Hazardous Materials Management Plan to PCR that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

2.14.4. STORAGE AND HANDLING

Coordinate storage of hazardous materials with PCR and abide by internal requirements for labelling and storage of materials and wastes.

Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.

All explosives must be mixed outside of the Park and delivered to the site. No storage of explosives shall be allowed within JNP.

Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.

Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

- Store hazardous materials and wastes in closed and sealed containers in good condition.

- Label containers of hazardous materials and wastes in accordance with WHMIS.
- Store hazardous materials and wastes in compatible containers.
- Segregate incompatible materials and wastes.
- Ensure that different hazardous materials or hazardous wastes are not mixed.
- Store hazardous materials and wastes in a secure storage area with controlled access.
- Maintain a clear egress from storage area.
- Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.
- Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.
- Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- Report spills or accidents immediately to PCR and follow requirements of Section 2.9.6

2.14.5. TRANSPORTATION

Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

2.14.6. MATERIALS

Only bring on site the quantity of hazardous materials required to perform Work. Maintain MSDSs in proximity to where the materials are being used and available to all personnel who may have contact with hazardous materials.

2.14.7. DISPOSAL

Dispose of hazardous waste materials in accordance with applicable federal and provincial Acts, Regulations, and Guidelines. Recycle hazardous wastes for which there is an approved, cost effective recycling process available.

Send hazardous wastes only to authorized hazardous waste disposal or treatment facilities. Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited. Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

2.15. CLOSEOUT PROCEDURES AND SUBMITTALS

2.15.1. PAYMENT

All Work associated with this item is considered incidental to the Work.

2.15.2. ADMINISTRATIVE REQUIREMENTS

Acceptance of Work Procedures are as follows:

- Coordinate inspections, identifying deficiencies and defects, and verifying that corrections have been made.
- Verify quantities with PCR upon task completion and mutually agreed upon by both parties.
- Payment of Holdback will be issued in accordance with contractual agreement.

2.15.3. CLOSEOUT SUBMITTALS

Maintain, in addition to requirements in General Conditions, the Contractor must maintain at site for PCR one record copy of:

- Contract Drawings (if provided).
- Specifications.
- Addenda.
- Amendments and other modifications to Contract.
- Inspection certificates.
- Manufacturer's certificates, if applicable.

Store record documents and samples on site apart from documents used for construction.

Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

Keep record documents and samples available for inspection by PCR.

2.15.4. RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

The following list of records shall be submitted to the PCR as indicated for each Task Authorization. Additional documentation may be requested.

Time of Submission	Document Description
Before commencement of Contract or if conditions change	A completed "Attestation and Proof of Compliance with Occupational Health and Safety (OHS)" form.
Before commencement of Work for each TA Before	Proof of applicable Parks Canada and Municipality of Jasper business licenses.
	Project Schedule – The Contractor shall provide the PCR with a detailed schedule of the workdays and manpower required to complete each phase of the project.
	The Contractor shall submit a list of key Contractor personnel, including names, position and telephone numbers.
	Work Plan – The Contractor shall submit a Work Plan describing the Contractor's intended methods of Work and projected number of equipment and personnel on site.
	Laboratory sample results of the materials shall be submitted to the PCR for approval.
	Quality Control Plan documenting Contractors procedures for maintaining the quality of work as per these specifications. Plan must include night inspections to verify retro-reflectivity of lines.
	Traffic Accommodation Strategy in accordance with these Specifications.
	Copy of Contractor's Health and Safety Plan including Site Specific Hazard Assessments
	List of all materials including Material Safety Data Sheets (MSDS) intended for use within the Park.
	An Emergency Response Protocol, documenting Contractors' procedures for handling emergencies.
Daily for duration of TA	Daily Work Reports identifying quantities used under each Contract Unit Price Item.
	Digital record of Daily Site Photos of work being executed with GPS and time stamps

As required/completed during TA	Back up documentation for materials delivered to work site.
	Daily, Weekly and Monthly Safety Inspections and Audits
	Incidents and Accident Reports
	Quality Control Records including notes from inspections with deficiencies and corrected by dates.
	Supplier waybills, quality documents, for materials used in this contract.
	Field book containing quantity control records including detailed and trackable counts of pay units
	Edited and raw survey data, where applicable.

SECTION 3 – ASPHALT MAINTENANCE SPECIFICATIONS

3. SPECIFICATIONS

Please review Appendix B for Typical Figures related to works within this Section.

3.1. MOBILIZATION AND DEMOBILIZATION

3.1.1. GENERAL

The Work consists of the mobilization and demobilization of Contractor's forces and equipment necessary for performing the Work required under the Contract. Mobilization will not be considered as Work in fulfilling the Contract requirements for commencement of Work.

Mobilization includes but is not limited to all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the Contractor's operations at the Site.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the Contract from the Site; including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the Site specifically for this Contract.

3.1.2. MEASUREMENT AND PAYMENT

Mobilization and demobilization costs will be included in unit prices each item of Annex B – Basis of Payment. No additional or separate payment will be made.

3.2. TRAFFIC ACCOMMODATION

All Traffic Accommodation costs including but not limited to preparation of an acceptable plan, supplying and installation of all necessary devices including signs, traffic delineators, barrels, etc. will be considered incidental to the Work. No additional or separate payment will be made for any cost associated with Traffic Accommodation.

3.2.1. GENERAL

All references in the following Section to Traffic shall be considered to include both Pedestrian and Vehicular Traffic.

The Contractor shall prepare a Traffic Accommodation Strategy (TAS) detailing their proposed methods for accommodating Traffic throughout the Work area each TA issued to the Contractor. The minimum requirements are specified in Alberta Transportation (AT) manual entitled Traffic Accommodation in Work Zones Manual, latest edition.

Unless otherwise specified, the Contractor shall submit the TAS to the PCR a minimum of 14 days prior to the pre-construction meeting for each TA. The PCR will review the TAS and communicate any concerns to the Contractor at the pre-construction meeting or earlier. Any issues or concerns regarding the Contractor's proposed TAS shall be addressed to the mutual satisfaction of the Contractor and the PCR prior to the commencement of the Work.

3.2.2. REQUIREMENTS FOR TRAFFIC ACCOMMODATION AND TEMPORARY SIGNING

The Contractor shall accommodate Traffic through the Work Zone on a 24-hour per day basis using any means at the Contractor's discretion, subject to the minimum requirements of the AT Traffic Accommodation in Work Zones manual and the following:

The Contractor must, at a minimum, include:

- Suitable provisions, including the use of detours, to accommodate all traffic safely and with minimum of inconvenience through or around the Work.
- Provide, install, maintain and protect traffic control devices such as signs, barriers, fences and lights at own expense.
- Provide the required number of flag persons, during all periods of active equipment operations which may affect normal traffic operations.
- Control his operations to ensure normal school bus operations are not interfered with.
- Traffic delays shall be limited to a maximum of ten (10) minutes.
- Ensure uninterrupted access to developments along the Project.
- Obtain approval from the PCR prior to changing or disrupting existing accesses and road crossings.
- Carry out construction operations in one continuous operation at road crossings, intersections and entrances for each phase of the Work.
- Provide and use such other methods or equipment necessary to accommodate traffic safely through the work site.
- Include provision in his TAS for Double Fines when Passing Workers in the active work area (AT Standard Drawing "TCS-B-8.1). The Contractor is advised that the signing sequence shown on this drawing is provided as general guidance only. The Contractor shall adjust the TAS and construction zone signing as required based on site conditions.

If the Contractor's operations are such that the active Work Area exceeds 5 km in length, the Contractor shall install interim "speed limit", "no passing" and "speed fines double" signs at the approximate mid-point of the active Work Area.

If the Contractor maintains separate active Work Areas where the cumulative length of the active Work Area plus any gaps exceeds 5 km, the Contractor must sign each active Work Area separately.

The Contractor shall remove or cover all traffic control devices when not essential for the safe accommodation of traffic, in order to eliminate unnecessary inconvenience to traffic.

3.2.3. TEMPORARY CONSTRUCTION SIGNING

The Contractor must supply all signing materials including signposts, weighted stands, brackets and any required mounting hardware and miscellaneous materials required for the erection of temporary construction signs. All traffic and warning signs must be either bilingual or of a symbolic or pictorial type.

All signs, barricades and other traffic control devices must conform to the requirements for shape, colour and size specified in Section V and Appendix C of the AT Traffic Accommodation in Work Zones (latest edition) manual.

The orange portion of all signs, barricades and other traffic control devices must be fully reflectorized using high brightness, retro-reflective, non-metallized, prismatic sheeting material which incorporates durable, transparent, fluorescent pigment and meets the brightness requirements as specified in ASTM D4956 for Type VIII sheeting. All other colours of sheeting

material must be Type III or Type IV high-intensity retro-reflective sheeting meeting or exceeding the minimum requirements as specified in ASTM-D4956.

Larger construction signs or oversized signs may be used where conditions require greater visibility in order to be effective. They must be used in special circumstances where more than average attention value is required from the sign.

The Contractor must supply all equipment required to complete the Work.

Work must not commence until all necessary temporary construction signs and all other traffic control devices, as proposed in the TAS, are in place.

Portable and non-portable signs must be placed on the shoulder of the road such that the face of the sign is fully visible to oncoming traffic and the bottom of the sign is not less than 0.3 m above the road surface for short duration projects, and no less than 1.5 m for long duration projects as specified in Traffic Accommodation in Work Zones manual. Portable stands must be securely weighted and erected to ensure against being blown over by prevailing winds or gusts from passing vehicles. Acceptable signage stands will be the WindMaster® Sign Stands or an approved dual-spring base equivalent.

PCR must be notified 72 hours in advance of when road lane or partial parking lot closures are required for construction activity. Traffic Control plans must be submitted for all Work undertaken that restrict the flow of traffic.

The Contractor is responsible for the supply and proper placement of temporary construction signs. However, in the case of potential danger to traffic or other circumstances where PCR determines that signing is inadequate, PCR may direct that changes to the Contractor's operations be implemented to remedy the situation. These changes may involve the use of different types and/or sizes of signs, modifying the number or locations of signs, and/or any other modifications or additions required to protect traffic.

3.2.4. ARROW AND MESSAGE BOARDS

Whenever required to accommodate traffic, the Contractor shall supply all sequential arrow or variable message boards to ensure the safe and efficient passage of traffic through the work zone.

Stationary arrowboards shall meet the following requirements:

- Minimum size of 1.22 m x 2.44 m (4 ft x 8 ft),
- Minimum of 25 lamps that are legible at a minimum distance of 1 200 m,
- Fully adjustable light intensity on all arrowboard lights,
- Operating modes which include:
 - sequential left arrow or chevron
 - sequential right arrow or chevron
 - sequential double arrow or chevron
 - horizontal bar
 - all four lamps in the extreme corners of the panel shall be flashing
- Truck-mounted mobile arrowboards shall meet the following requirements:
 - Minimum size of 0.75 m x 1.52 m (2.5 ft x 5 ft),
 - Minimum of 25 lamps are legible at a minimum distance of 1 200 m,
 - Fully adjustable light intensity on all arrowboard lights,
 - Operating modes which include:
 - sequential left arrow or chevron

- sequential right arrow or chevron
- sequential double arrow or chevron
- horizontal bar
- all four lamps in the extreme corners of the panel shall be flashing

3.2.5. FLAGPERSONS

Whenever construction operations or Work Zone conditions cause interruption, delay or hazard to traffic and necessitates the use of flag persons; the Contractor shall provide and equip responsible flag persons for the direction and control of traffic. The Contractor shall ensure that flag persons are instructed in and use proper traffic control procedures appropriate for the prevailing conditions. Flag persons shall have proof of certification from a recognized training program on traffic control procedures through construction zones.

Flag persons' apparel must be in compliance AT Traffic Accommodation in Work Zones Manual

3.2.6. DUST CONTROL

The Contractor shall maintain detours and disturbed roadways that carry traffic within the Project limits free of excessive dust. In this case, "disturbed roadways" shall mean sections of roadway under construction and/or sections of roadway being used by the contractor for hauling of equipment or materials. The Contractor shall supply and apply all approved dust abatement materials at their own expense.

If the Contractor fails to promptly undertake dust abatement measures, the PCR may make other arrangements to have the Work done and deduct the cost thereof from any money owing to the Contractor.

3.2.7. COMPLIANCE

The Contractor shall promptly make any modifications to the traffic accommodation operations deemed necessary by PCR. Where, in the opinion of PCR, the Contractor fails to adequately provide for the safety of the public, has recurring safety infractions and/ or when the Contractor fails to comply with orders issued by the PCR regarding traffic accommodation operations, the PCR may suspend Work. The shutdown will remain in effect until direction to resume Work is given by the PCR.

In cases where the Contractor is not in compliance with the Specification requirements and, in the opinion of the PCR, there is imminent danger to traffic, the PCR has the authority to order the immediate suspension of Work. Such orders, when issued, will be made in writing.

3.2.8. MEASUREMENT AND PAYMENT

All Traffic Accommodation costs including but not limited to preparation of an acceptable plan, supplying and installation of all necessary devices including signs, traffic delineators, barrels, etc. will be considered incidental to the Work and included in each unit price identified in Annex B - Basis of Payment. No additional or separate payment will be made for any cost associated with Traffic Accommodation.

3.3. ROADWAY LINES AND MARKING

3.3.1. GENERAL

Painting of interim traffic markings (spotting), referencing of the ends of no passing zones (barrier lines) and spot marking where Scope of Work obliterates the existing pavement markings, is incidental to the Work. No additional or separate payment will be made for any cost associated with Roadways Lines and Marking.

3.3.2. PROCEDURE

3.3.2.1. Removal of Incorrectly Painted Lines

All lines that are incorrectly painted by the Contractor or painted where no lines are specified must be removed by the Contractor at their own expense and to the satisfaction of PCR. The method and equipment used by the Contractor to remove incorrectly painted lines will be subject to the approval of PCR.

3.3.3. ACCEPTANCE CRITERIA

The Work will be considered acceptable under the following conditions:

- Any incorrectly painted lines or lines painted at improper locations have been removed to the satisfaction of PCR.

3.3.4. MEASUREMENT AND PAYMENT

Interim marking of roadway lines and markings shall be considered incidental to the Work and no additional or separate payment will be made.

3.4. SUPPLY OF GRANULAR AGGREGATE MATERIAL

3.4.1. GENERAL

The Contractor shall supply aggregate material for applicable unit prices for each item of Annex B – Basis of Payment and no additional or separate payment will be made.

3.4.2. PRODUCTION

Aggregate produced from all sources shall comply fully with the Specifications, and the Contractor shall recognize and satisfy themselves as to the type and amount of work that may be necessary to produce the material required. The aggregate shall meet the specified requirements as shown in the table below for the material specified. The Contractor shall adjust and modify aggregates as required in order to meet specification requirements.

The crushed aggregate shall be composed of sound, hard and durable particles of sand, gravel and rock; and shall be free from elongated particles, injurious quantities of flaky particles, soft shales, organic matter, clay lumps and other foreign matter.

Acceptance of processed aggregates shall take place when they are in their final position and have met all the requirements of the Contract. The PCR may test at any time and reject material that does not meet Specifications.

For Designation 1 aggregates used for wearing surfaces (top lift), the Contractor shall produce aggregates such that material retained on the 5 000-micron sieve shall not contain more than 3% detrimental matter based on the total mass of the combined aggregates in the final product.

Prior to the production of any aggregate for use as a wearing surface, the Contractor shall submit an action plan to the PCR detailing the action to be taken in the event the Specification requirement for detrimental matter cannot be achieved. Aggregates for use as a wearing surface shall not be accepted until such an action plan has been approved by the PCR.

Designation		1	2	2	2	6	6
Class (mm)		12.5	20	25	40	80	125
Percent Passing Metric Sieve (CGSB 8-GP-2M) μ m	125000						100
	80000					100	
	50000					55-100	55-100
	40000				100		
	25000			100	70-94	38-100	38-100
	20000		100	82-97			
	16000		84-94	70-94	55-85	32-85	32-85
	12500	100					
	10000	83-92	63-86	52-79	44-74		
	5000	55-70	40-67	35-64	32-62	20-65	20-65
	1250	26-45	20-43	18-43	17-43		
	630	18-38	14-34	12-34	12-34		
	315	12-30	9-26	8-26	8-26	6-30	6-30
	160	8-20	5-18	5-18	5-18		
80	4-10	2-10	2-10	2-10	2-10	2-15	
% Fracture by Weight (2 Faces)	All + 5000	60+	60+	60+	60+	N/A	N/A
L.A. Abrasion (% Loss Max.)		40	50	50	50	N/A	N/A
Micro-Deval (% Loss Max.)		17	21	21	21	N/A	N/A

* Designation 1 - Asphalt Concrete Pavement

* Designation 2 - Granular Base Course

* Designation 6 - Gravel Fill

3.4.3. QUALITY CONTROL

For all sources, quality control testing is the responsibility of the Contractor. Tests performed by the PCR will not be considered to be quality control tests. Unless otherwise directed, test methods and frequencies will be performed to AT standard testing methods per the Standard Specifications for Highway Construction.

The Contractor shall use Professional Engineering services and a qualified testing laboratory licensed to practice in the Province of Alberta to assess and where necessary, modify the aggregate materials being produced to ensure their end use meets all Specification requirements.

The Contractor shall provide the PCR with all Quality Control Testing results for review a minimum of seven (7) business days prior to using any material for the Work. Stockpiled material must have a sample tests completed within the current calendar year.

3.4.4. MEASUREMENT AND PAYMENT

Payment for the Supply of Granular Aggregate Material including the supply of aggregate, producing crushed aggregate and blend sand, stockpiling, processing and all Quality Control Testing of the material will be included in the unit price for each item of Annex B – Basis of Payment for which the material is being used and no additional or separate payment will be made.

3.5. SUPPLY OF ASPHALT CONCRETE PAVEMENT MATERIAL

3.5.1. GENERAL

The Work consists of preparing a mix design, producing asphalt concrete pavement material for pavement patching and other work. Asphalt concrete pavement shall consist of crushed aggregate, blend sand, as required, and asphalt cement which is combined in a hot mix plant.

3.5.2. MIX DESIGN AND PRODUCTION

Preparation and submission of asphalt mix designs for PCR verification and approval are the responsibility of the Contractor. The Contractor shall use Professional Engineering services and a qualified testing laboratory licensed to practice in the Province of Alberta, to assess the aggregate materials proposed for use and to carry out the design of the asphalt mixture.

All costs incurred in mix design formulation are the responsibility of the Contractor. Shipping costs for samples sent to the PCR (if required) for verification and approval are the responsibility of the Contractor.

All asphalt mixes shall be treated with a liquid anti-strip additive regardless of test results reported for evaluation of moisture susceptibility on the untreated mixture. The dosage rate shall be based upon the supplier's recommendation and shall be a minimum of 0.3% for Group A anti-strip additives and 0.05% for Group B additive products as identified on the AT Products List. Dosage rates greater than 0.5% by weight of virgin binder will only be allowed if the Contractor completes rheology testing using the AASHTO R 29 Standard Practice for Grading or Verifying the Performance Grade (PG) of an Asphalt Binder to confirm that the treated virgin binder meets the specified PG criteria. Dosage rates are by weight of virgin asphalt binder. The Contractor shall include the following information with the mix design submission:

- Full details on the type of liquid anti-strip additive proposed for use; including product name, manufacturer and supplier;
- Additive rate,
- TSR values for the treated and untreated mixes,

- The proposed method for incorporating the additive into the plant produced mix; and
- When the liquid anti-strip is not added by the asphalt supplier, the Contractor shall provide documentation from the asphalt binder supplier that the proposed anti-strip additive is compatible with the asphalt crude source and grade contained in the mix design when added within the dosage range recommended by the additive supplier.

All costs associated with the supply and incorporation of liquid antistripping additive or hydrated lime into the asphalt concrete pavement mix, regardless of whether the additives are incorporated by the asphalt supplier or the Contractor, shall be included in the unit price for the applicable item of Annex B – Basis of Payment and no separate or additional payment will be made.

Asphalt concrete pavement (ACP) material of the Mix Type requested in the Work Order shall be produced to comply with the following and compliant with AT M1:

Class for Des 1 Agg. (mm)	% MF, - 5000 (Min) (Note 1)	% Fractures +5000 (2 faces) (Min)	Asphalt Cement Grade	Marshall Stability N (Min)	No. of Blows	Air Voids %	VMA % (Min.) by % Air Voids		Voids Filled with Asphalt %	Flow mm	Retained Stability % (Min.)
							3.5	4			
12.5	50	60	PG58-28	8000	75	Note 2	13.5	14	65 to 75	2 to 3.5	70

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

Note 2 - The Design Air Voids shall be chosen as the lowest value, within the range of 3.5 to 4.0% inclusive, such that all other mix design criteria are met.

General requirements for mix design:

- A minimum of four specimens shall be prepared at each asphalt content,
- Theoretical maximum specific gravity shall be determined in duplicate for at least three asphalt contents; and
- Retained Stability after a 24-hour soaking at 60° C to be run at the recommended design asphalt content.

3.5.3. SAMPLING AND TESTING

The Contractor is required to provide the PCR with a copy of the applicable mix design for the material being supplied seven (7) days prior commencement of Work. The PCR may perform additional testing to verify that the asphalt concrete mix complies with the Specifications.

Quality control testing is the responsibility of the Contractor throughout every stage of the Work from the crushing and production of aggregates to the final accepted product. Tests performed by the PCR will not be considered to be quality control tests. The Contractor shall provide and pay for equipment and qualified personnel to obtain all quality assurance core samples and perform all quality control testing necessary to determine and monitor the characteristics of the materials produced and incorporated into the Work, and the final product produced.

The Contractor shall undertake the quality control testing and provide results within 24-hours to the PCR for review. The Contractor shall supply material samples to the PCR for Quality Assurance testing purposes when requested.

3.5.4. MEASUREMENT AND PAYMENT

Payment for the Supply of Asphalt Concrete Pavement including the supply of aggregate, the supply of asphalt binder, producing crushed aggregate and blend sand, processing the mix, preparation of any mix design and all Quality Control testing within this Section shall be included in the unit price for the applicable item of Annex B – Basis of Payment and no separate or additional payment will be made.

3.6. EXCAVATION

3.6.1. GENERAL

The Work consists of excavating subgrade soil and/or granular materials from failed areas in the roadway or approaches, generally for roadway strengthening. Excavation for the removal of culverts shall be in accordance with and compensated in Section 3.16.

3.6.2. CONSTRUCTION

Following the Full Depth Asphalt Removal (see Section 3.8) if the roadbed is unsuitable for asphalt placement, the PCR may direct further excavation. The extents will be determined following consultation with the PCR.

Contractor to excavate the material to the dimensions and depths as directed by the PCR for disposal or salvage and reuse if the material is suitable. Excavated material that is unsuitable for re-use will be disposed of at an acceptable offsite location as directed by the PCR. Excavated material that is suitable will be stockpiled at a location where it will not be a hazard to the environment or the public.

Prior to backfilling the excavated area, the Contractor will arrange to have the PCR inspect the area to ensure the extents are sufficient and verify approximate dimensions of the excavation. Survey of excavations, or other means of measurement found acceptable by the PCR, will be done and submitted prior to backfill of the excavation.

3.6.3. MEASUREMENT AND PAYMENT

Measurement for excavating granular or subgrade materials will be in cubic metres based on the volume of excavated material in its original position.

Payment will be made at the unit price bid per cubic metre for **Items A1, B1, C1 “Excavation”** of Annex B – Basis of Payment. This payment will be full compensation for excavating, hauling and salvaging or excavating, hauling and disposing of the material in the Marmot Pit or approved area outside of JNP, and all labour, equipment, tools and incidentals necessary to complete the Work.

3.7. BACKFILL

3.7.1. GENERAL

The Work consists of backfilling subgrade excavations with existing or imported subgrade soil and/or granular materials.

3.7.2. CONSTRUCTION

Backfilling operations shall commence immediately following acceptance of the excavation by the PCR. If the salvaged material is used, it shall be placed and compacted in the excavated area to required thickness as directed by the PCR. Once all available salvageable material is used, imported granular material (See Section 3.4 Supply of Granular Aggregate Material, Subsection 3.4.2) may be required for backfilling to complete the grade to underside of pavement. Contractor will supply the appropriate material as needed to complete the backfill.

When importing granular backfill, the material shall be Designation 2 or as directed by the PCR.

Backfilling shall be placed in lifts no more than 150 mm in compacted depth and meet or exceed 98% SPMDD @ Optimum Moisture Content.

Once backfilling is complete, apply prime coat to the approved base by means of hand spraying, ensuring there is no excess overspray. Prime coat should be applied per manufacturers specification for temperature and Contractor shall ensure that rain is not in the forecast prior to application to allow at least 3 hours of time to set up. Prime coat material to be emulsified asphalt conforming to AASHTO M 140. Apply prime coat at a rate of approximately 1.5 L/m². Extend the prime coat a sufficient distance beyond the edge of the repair area to allow for a smooth transition of the patching material to the existing pavement surface. Prime coat is applied in preparation for asphalt placement.

3.7.3. MEASUREMENT AND PAYMENT

Measurement for backfilling excavations with salvaged or imported material will be in cubic metres based on the surveyed volume or in-field measurement of the backfill material in its final compacted position.

Payment will be made at the unit price per cubic metre for **Items A2.a, B2.a, C2.a** “**Backfill – Salvaged Material – Stockpile and Install**” of Annex B – Basis of Payment for material that was deemed acceptable for use and replaced in the excavation. This payment will be full compensation for placing and compacting the salvaged material, and all labour, equipment, tools, testing and incidentals necessary to complete the Work.

Payment will be made at the unit price bid per cubic metre for **Items A2.b, B2.b, C2.b** “**Backfill – Imported Material – Des 2 – Supply and Install**” of Annex B – Basis of Payment for material placed in the excavation. This payment will be full compensation for supply, placing and compacting the imported material, and all labour, equipment, tools, testing and incidentals necessary to complete the Work.

3.8. FULL DEPTH ASPHALT REMOVAL

3.8.1. GENERAL

Work shall include sawcutting sections of deteriorated asphalt, removing and disposing of material, scarifying, fine grading and preparing for pavement of the existing base for areas as marked in the drawings or in the field.

The depth of asphalt shall be estimated at 50 mm and 100 mm.

3.8.2. CONSTRUCTION

The Contractor shall mark the outline of the damaged area with a lumber crayon or spray paint for acceptance by PCR. Then mark a cutline on pavement 300 mm out from damage area ensuring a smooth transition between the existing asphalt surface and the new patch material.

Using a pavement saw, cut the pavement out on the cutline. Sawcutting shall be in accordance with Section 3.12, Sawcutting of Pavement. Edges should be smooth and vertical; ragged edges will result in pavement failures around the new patch.

Remove and dispose the cut pavement at an acceptable offsite location as directed by the PCR. If necessary and approved by the PCR, remove all underlying base material as deep as necessary (per applicable section for excavation and backfill) to reach firm support.

3.8.3. MEASUREMENT AND PAYMENT

Measurement for excavating asphalt materials will be in square meters based on the area of excavated material in its original position.

Payment will be made at the unit price bid per square metre for Items A3.a, B3.a, C3,a "Full Depth Asphalt removal – 50 mm Depth" or Items A3.b, A2.3.b B3.b, C3,b "Full Depth Asphalt removal – 100 mm Depth of Annex B – Basis of Payment as applicable to the work. This payment will be full compensation for sawcutting, excavating and off-site disposal of deteriorated asphalt pavement, and all labour, equipment, tools and incidental necessary to complete the Work.

No additional payment will be made for removal of the existing asphalt that is found to be at a greater depth than indicated.

3.9. POTHOLE FILLING

3.9.1. GENERAL

Pothole Filling consists of spreading and compacting asphalt bound aggregate mix (ie: asphalt concrete pavement, or proprietary mix), by means of machine (eg: skid steer), or by hand, in a hole or shallow excavation as directed by the PCR. The area to be repaired shall be marked out by the PCR. Areas for Pothole Filling will be a maximum size of 1 square metre by any depth necessary.

3.9.2. MATERIALS

Asphalt concrete patching material supplied by the Contractor shall be a coarse mix (or similar) produced in accordance with Section 3.5.

3.9.3. CONSTRUCTION

Remove loose debris or other objectionable material from the areas to be patched by sweeping or other methods. Loose debris material shall be disposed of offsite at an approved location.

Apply prime or tack coat to the approved base by means of hand spraying ensuring there is no excess overspray. Prime and tack coat should be applied per manufacturers specification for temperature and Contractor shall ensure that rain is not in the forecast prior to application to allow at least 3 hours of time to set up. Tack coat material to be emulsified asphalt conforming to AASHTO M 140. Apply tack coat at a rate of approximately 1.5 L/m². Extend the tack coat a sufficient distance beyond the edge of the repair area to allow for a smooth transition of the patching material to the existing pavement surface.

Place patching material in areas indicated by the PCR, ensuring positive drainage on all surfaces. Feather material on the edges of a patch using rakes or lutes. Coarse material shall be removed from the patch edges.

Spread patching material in uncompacted lifts not exceeding 100 mm in depth and compacted to produce a hard, stable surface which does not rut or otherwise distort under traffic loading. Lifts shall be allowed to cool sufficiently prior to placing successive lifts.

The Contractor shall be responsible for the selection of the type and number of units of compaction equipment. The Contractor shall provide a sidewalk roller, hand tampers and other compaction equipment as required for compaction in small or restricted areas.

Minimum Density requirement for roadways is 98%, +/- 2% of the maximum theoretical density. Minimum Density requirement for campgrounds and parking lots is 97% +/- 2% of the maximum theoretical density.

Compaction and finishing to the specified density and surface tolerances shall be completed before the asphaltic mixture has dropped in temperature to 65°C.

Patching material placed in a depression shall be compacted such that the completed patch is approximately 15 mm higher than the surrounding undisturbed pavement, but with the material on the longitudinal edges "feathered" to provide a smooth transition between the patch and the existing pavement surface.

Evaluation of the Work will be based on a visual inspection by the PCR. To be acceptable, the patched area shall be adequately filled and shall provide a dense, smooth and level transition between the treated area and the adjacent undisturbed pavement surface.

Finish Tolerances as follows;

- Smoothness: maximum variation under straight edge as follows:
- Longitudinal in direction of travel: 3 mm,
- Transverse to direction of travel: 6 mm,
- Texture: finished surface shall have a tightly knit texture free of visible signs of poor workmanship such as, but not limited to:
 - segregation,
 - areas exhibiting excess or insufficient asphalt, and
 - improper matching of longitudinal and transverse joints, roller marks, cracking, or tearing.

Re-treat any failed areas at Contractors expense.

Ensure that necessary interim traffic markings (spotting) is completed once work has been completed. .

Remove and dispose of any loose material and leave the Site in a clean condition.

3.9.4. MEASUREMENT AND PAYMENT

Measurement for Pothole Filling shall be made by the number of potholes, filled to any depth, and approved by the PCR.

Payment will be made at the unit price bid per unit for **Items A4, B4, C4 “Pothole filling (< 1m²)”** of Annex B – Basis of Payment. These Payments will be full compensation for removal of loose debris, supplying, applying and maintaining tack coat; supplying the asphalt binder; processing, hauling and placing the mix, interim lane marking, quality control, and re-testing following corrective work, if applicable, and all incidentals necessary to complete the Work.

3.10. ASPHALT PATCHING

3.10.1. GENERAL

Asphalt Patching consists of spreading and compacting asphalt bound aggregate mix (ie: asphalt concrete pavement, or proprietary mix), by means of paver, machine (eg: motor grader), or hand on a prepared pavement surface or in a shallow excavation to the lines and dimensions as directed by the PCR. The area to be repaired shall be marked out by the PCR.

3.10.2. MATERIALS

Asphalt concrete patching material supplied by the Contractor shall be a coarse mix (or similar) mix produced in accordance with Specification 3.5. The use of other commercially produced products shall be subject to the approval of the PCR.

3.10.3. CONSTRUCTION

Remove loose debris or other objectionable material from the areas to be patched by sweeping or other methods. Loose debris material shall be disposed of offsite at an approved location. The Contractor shall remove and dispose of any failed Asphalt Concrete Pavement outside of JNP.

Apply prime or tack coat to the approved base by means of hand spraying ensuring there is no excess overspray. Prime and tack coat should be applied per manufacturers specification for temperature and Contractor shall ensure that rain is not in the forecast prior to application to allow at least 3 hours of time to set up. Tack coat material to be emulsified asphalt conforming to AASHTO M 140. Apply tack coat at a rate of approximately 1.5 L/m².

For patching on existing pavement surfaces, extend the tack coat a sufficient distance beyond the edge of the repair area to allow for a smooth transition of the patching material to the existing pavement surface.

Place asphalt concrete pavement in areas indicated by the PCR, ensuring positive drainage on all surfaces. Feather material on the edges of a patch using rakes or lutes. Coarse material shall be removed from the patch edges.

Spread patching material in a single lift when the compacted thickness is less than 70 mm, or in two or more lifts when the compacted thickness is greater than 70 mm. Lifts shall be allowed to cool sufficiently prior to placing successive lifts and compacted to produce a hard, stable surface which does not rut or otherwise distort under traffic loading.

The Contractor shall be responsible for the selection of the type and number of units of compaction equipment. The Contractor shall provide a sidewalk roller, hand tampers and other compaction equipment as required for compaction in small or restricted areas. For larger patches greater than 10 m², Contractor's compaction equipment to include steel drum vibratory breakdown and finish rollers, and a pneumatic tire roller to be used during placement of the mix.

Minimum Density requirement for roadways is 98%, +/- 2% of the maximum theoretical density. Minimum Density requirement for campgrounds and parking lots is 97% +/- 2% of the maximum theoretical density.

Compaction and finishing to the specified density and surface tolerances shall be completed before the asphaltic mixture has dropped in temperature to 65°C.

Patching material placed in a depression shall be compacted such that the completed patch is approximately 15 mm higher than the surrounding undisturbed pavement, but with the material on the longitudinal edges "feathered" to provide a smooth transition between the patch and the existing pavement surface.

Patching material placed in a patch that is in a rutted depression parallel to the wheel paths, shall be compacted such that the completed patch is level with the adjacent undisturbed pavement. In addition, the material on the edges of the patch shall be feathered to provide a smooth transition between the patch and the existing pavement surface.

Evaluation of the Work will be based on a visual inspection by the PCR. To be acceptable, the patched area shall be adequately filled and shall provide a dense, smooth and level transition between the treated area and the adjacent undisturbed pavement surface.

Finish Tolerances as follows;

- Smoothness: maximum variation under 3 m straight edge as follows:
- Longitudinal in direction of travel: 3 mm,
- Transverse to direction of travel: 6 mm,
- Texture: finished surface shall have a tightly knit texture free of visible signs of poor workmanship such as, but not limited to:
 - segregation,
 - areas exhibiting excess or insufficient asphalt, and
 - improper matching of longitudinal and transverse joints, roller marks, cracking, or tearing.

Re-treat any failed areas at Contractors expense.

Ensure that necessary interim traffic markings (spotting) is completed once work has been completed. Remove and dispose of any loose material and leave the site in a clean condition.

3.10.4. MEASUREMENT AND PAYMENT

3.10.4.1. Asphalt Patching – 50 mm Depth

Measurement for Items A5.a, A2.5.a B5.a, C5.a “Asphalt Patching – 50 mm depth (1-10 m²)” and Items A5.b, B5.b, C5.b “Asphalt Patching – 50 mm depth (10-100 m²)” of Annex B – Basis of Payment shall be by square metre of the finished surface accepted to a maximum depth of 50 mm and approved by the PCR.

Payment will be made at the unit price bid per square metre for Items A5.a, A2.5a, B5.a, C5.a “Asphalt Patching – 50 mm depth (1-10 m²)” and Items A5.b, B5.b, C5.b “Asphalt Patching – 50 mm depth (10-100 m²)” of Annex B – Basis of Payment. This payment will be full compensation for Supply of Asphalt Concrete Pavement, supplying, applying and maintaining tack coat; supplying the asphalt binder; processing, hauling and placing the mix, interim lane marking, quality control, re-testing following corrective work, if applicable.

3.10.4.2. Asphalt Patching – 100 mm Depth

Measurement for Items A5.c, A2.5c, B5.c, C5.c “Asphalt Patching – 100 mm depth (1-10 m²)”, Items A5.d, B5.d, C5.d “Asphalt Patching – 100 mm depth (10-100 m²)” and Items A5.e, A2.5e, B5.e, C5.e “Asphalt Patching – 100 mm depth (100-500 m²)” of Annex B – Basis of Payment shall be by square metre of the finished surface accepted to a maximum depth of 100 mm and approved by the PCR. Lifts in excess of 100 mm must be approved by the PCR prior to filling and will be measured as additional area.

Payment will be made at the unit price bid per square metre for Items A5.c, A2.5c, B5.c, C5.c “Asphalt Patching – 100 mm depth (1-10 m²)”, Items A5.d, B5.d, C5.d “Asphalt Patching – 100 mm depth (10-100 m²)” and Items A5.e, A2.5e, B5.e, C5.e “Asphalt Patching – 100 mm depth (100-500 m²)” of Annex B – Basis of Payment. This payment will be full compensation for Supply of Asphalt Concrete Pavement, supplying, applying and maintaining tack coat; supplying the asphalt binder; processing, hauling and placing the mix, interim lane marking, quality control, and re-testing following corrective work, if applicable.

3.11. ASPHALT CONCRETE PAVEMENT OVERLAY

3.11.1. GENERAL

The Work consists of spreading and compacting, Asphalt Concrete Pavement mix as detailed in Section 3.5, by means of paver over a prepared pavement surface to the lines and dimensions as directed by the PCR. Areas will be minimum of one travel lane and in excess of 100 m². Unless otherwise directed, the overlay thickness shall be a minimum of 50 mm.

3.11.2. MATERIALS

Asphalt concrete patching material supplied by the Contractor shall be a coarse mix (or similar) mix produced in accordance with Specification 3.5.

3.11.3. TRUCK WEIGH SCALES

The Contractor is required to provide silo scales or platform scales. Platform scales must be of sufficient length and capacity to accommodate, in a single loading, any truck, including pups or trailers, that are used.

All weigh scales must be certified by Measurement Canada or its successor, an agency of Industry Canada. The most recent certificate for a scale must be displayed at all times. In the event a certified scale is modified in any way, it must be re-certified prior to being used.

Any truck, including pups or trailers, must have all wheels and axle combinations completely on the scale during tarring and final weight measurements. The PCR may, verify the accuracy of the weigh scale at any time and the Contractor is required to provide all test weights, equipment, facilities and operating staff required to verify the weigh scale and to cooperate fully in the verification process.

The Contractor will not be permitted to use grain elevator scales or inspection station scales in lieu of testing the weigh scale. The PCR may direct that haul trucks be weighed on inspection station scales for verification purposes.

The Contractor is required to operate controls for loading material into trucks. All costs associated with providing and installing the truck weigh scales and scale house and the testing or certification of the weigh scales, is the responsibility of the Contractor and no separate payment will be made.

3.11.4. CONSTRUCTION

3.11.4.1. Preparation

Remove debris or other objectionable material from the surface to be paved by scraping, sweeping or other approved methods and remove from site to an approved location.

Remove and dispose of any failed Asphalt Concrete Pavement in the area to be patched as directed by the PCR.

Apply tack coat on all asphalt to asphalt contact surfaces, including vertical edges of patches.

Tack coat material to be emulsified asphalt conforming to AASHTO M 140. Apply tack coat at a rate of approximately 1.5 L/m². Paint contact surfaces of curbs, gutters, headers, manholes, catch basins and like structures with a thin, uniform coat of tack material.

3.11.4.2. Transitional Pavement Joints

Transitional pavement joints will be required where new overlays join existing pavement, or as directed by the PCR. Transverse joints shall be made in such a manner as to provide proper bonding between the two mats the full depth of the joint. The existing pavement shall be cold-milled to expose a vertical surface against which new ACP may be placed. The depth of the cold milling shall be equal to the thickness of the overlay lift. The minimum slope of the milled area shall be 200 horizontal to 1 vertical. Transverse joints must be cut at 45° to the centerline of the roadway across the travel lanes or the full width of the mat.

Whenever the existing pavement has been removed in advance of paving the joint area and traffic is to be released over the joint area, the Contractor shall construct a smooth taper out of hot mix asphalt (or approved equivalent material) to a slope of at least 50 horizontal to 1 vertical. The taper shall be placed on tar paper and shall be removed when paving is resumed as directed by the PCR. The transverse joint shall be straight and have a vertical face when the taper is removed.

The maximum duration delay between milling and paving shall be seven (7) calendar days.

Unless otherwise directed by the PCR, the Contractor shall assume ownership of all RAP resulting from cold milling operations and dispose of the material in an approved manner outside of the JNP.

3.11.4.3. Placement and Compaction

Construct a uniform smooth riding surface, a nominal mat thickness at each work location, smooth transitions to join existing pavement, and uniform radii of curvature in the curves for the new pavement.

Center pavement on the center of the existing lane, and generally match the existing road profile, unless otherwise directed by the PCR.

Wherever possible, longitudinal joints shall be offset from underlying longitudinal joints by 150 mm. Longitudinal edges will be "feathered" to provide a smooth transition between the overlay and the existing pavement surface.

Contractor's compaction equipment to include steel drum vibratory breakdown and finish rollers, and a pneumatic tire roller to be used during placement of the mix. The Contractor shall be responsible for the selection of the type and number of units of compaction equipment. The Contractor shall provide a sidewalk roller, hand tampers and other compaction equipment as required for compaction in restricted areas.

Minimum Density requirement for roadways is 98%, +/- 2% of the maximum theoretical density. Minimum Density requirement for campgrounds and parking lots is 98% +/- 2% of the maximum theoretical density.

Compaction and finishing to the specified density and surface tolerances shall be completed before the asphaltic mixture has dropped in temperature to 65°C.

3.11.4.4. Finishing

Finish Tolerances as follows;

- Smoothness: maximum variation under 3 m straight edge as follows:
- Longitudinal in direction of travel: 3 mm.
- Transverse to direction of travel: 6 mm.
- Texture: finished surface shall have a tightly knit texture free of visible signs of poor workmanship such as, but not limited to:
 - segregation,
 - areas exhibiting excess or insufficient asphalt,
 - improper matching of longitudinal and transverse joints, roller marks, cracking, or tearing.

Ensure that necessary interim traffic markings (spotting) is completed once work has been completed.

3.11.5. MEASUREMENT AND PAYMENT

Measurement for **Items A6, B6, C6 “Asphalt Concrete Pavement Overlay – 50 mm Depth”** of Annex B – Basis of Payment shall be made by the tonne of finished surface accepted to an average depth of 50 mm and as approved by PCR. The contractor shall supply a digital printout of a scale summary as well as individual haul tickets each day to the PCR for verification of the total material hauled.

Payment will be made at the unit price per tonne for **Items A6, B6, C6 “Asphalt Concrete Pavement Overlay – 50 mm Depth”** of Annex B – Basis of Payment. This payment will be full compensation for Supply of Asphalt Concrete Pavement, supplying, applying and maintaining tack coat; supplying the asphalt binder; processing, hauling and placing the mix, interim lane marking, quality control, and re-testing following corrective work, if applicable.

Constructing transverse pavement joints including any required cold milling will be considered incidental to the Work and will not be paid for separately.

Construction and removal of temporary asphalt tapers is considered incidental to the work and no separate payment will be made.

3.12. SAWCUTTING OF PAVEMENT

3.12.1. GENERAL

Work included in this item is for the full depth, vertical sawcutting of asphalt concrete pavement to facilitate the placement of new asphalt material, repair of manholes, catch basins and valves.

The equipment shall be capable of producing a smooth vertical saw cut without causing damage to the adjacent pavement.

3.12.2. CONSTRUCTION

The Contractor shall cut existing pavement to the full thickness of the structure so that a smooth vertical edge results, against which new materials can be effectively placed and compacted. Rough, jagged edges will not be acceptable.

All concrete, asphalt concrete pavement, and base course material that is cut-away shall be the responsibility of the Contractor and excavated, loaded, hauled and disposed of at a suitable disposal site.

3.12.3. MEASUREMENT AND PAYMENT

All Work associated with this item, including the removal and disposal of excavated material, is considered incidental to the Work, and no separate or additional payment will be made.

3.13. COLD MILLING ASPHALT PAVEMENT

3.13.1. GENERAL

Cold milling asphalt pavement is the process of removing existing pavement from the roadway to the lines and dimensions as directed by the PCR.

The material produced as a result of cold milling will be defined as reclaimed asphalt pavement (RAP). Unless otherwise agreed with the PCR, the Contractor shall assume ownership of the RAP material and shall haul it from the roadway to their own storage site or otherwise dispose of it outside of JNP.

3.13.2. CONSTRUCTION

3.13.2.1. Equipment

The Contractor shall use equipment with automatic grade and slope controls, capable of cold milling existing asphalt pavement to an accurate depth of cut, profile and cross slope and shall be capable of loading the milled material directly into trucks.

The cutting head of the cold milling machine shall be a minimum width of 1.9 metres.

3.13.2.2. Cold Milling Asphalt Pavement

Cold milling asphalt pavement shall be performed in a manner which prevents the tearing and breaking of underlying and adjacent pavement and the contamination of the RAP with granular, subgrade or deleterious materials. All RAP shall be loaded directly to trucks from the milling machine and hauled to stockpile or disposed of.

The milled roadway surface shall be swept clean prior to opening to traffic. At locations including but not limited to urban areas and bridge decks, the Contractor shall sweep the surface in a manner which minimizes dust.

The Contractor shall, at his own expense, promptly repair any localized areas of distress in the milled surface that may present a hazard to traffic.

At the point of daily termination of cold milling operations, changes in roadway surface profile or cross-section shall be limited to 50 mm and longitudinal transitions shall be a maximum of 25 mm vertically per metre.

In the event of rain or other inclement weather, the Contractor shall suspend cold milling operations. The Contractor shall make necessary allowances for drainage of water that may pond in areas where the milled sections have not been paved.

3.13.3. MEASUREMENT AND PAYMENT

Measurement of cold milling asphalt pavement will be made in square meters of roadway milled.

Payment will be made at the unit price bid per square metre for **Items A8, B8, C8 “Cold Milling Asphalt Pavement”** of Annex B – Basis of Payment. This payment will be full compensation for cold milling the asphalt pavement, sweeping the milled surface, loading the RAP into trucks, stockpiling or disposing of the RAP and quality control testing as required.

3.14. CRACK ROUTING AND SEALING

3.14.1. GENERAL

The Work consists of routing, cleaning and drying cracks in pavement surfaces supplying crack sealant material and sealing the routed cracks with the sealant. The cracks will be marked by PCR.

3.14.2. MATERIALS

3.14.2.1. Crack Sealant

The Contractor shall supply Deery 101 ELT hot pour rubberized crack sealant material or equivalent material from the proven products of the AT Products List and approved by the PCR.

The Contractor shall verify that all crack sealant delivered and used in the Work is the type and grade ordered.

Quality Control, including the provision of Quality Control test results for the crack sealant materials, is the responsibility of the Contractor. The Contractor shall provide copies of the material supplier Quality Control testing for each batch of material supplied. The Contractor shall supply material samples to the PCR for Quality Assurance testing purposes when requested.

3.14.2.2. Blotting Agents

When necessary, the Contractor shall supply one of the following blotting agents:

- screened sand with a maximum top size of 2 mm
- cement
- fly-ash

The use of other blotting agents shall be subject to approval by the PCR0.

3.14.3. EQUIPMENT

The Contractor shall supply all equipment necessary for completion of the Work including but not limited to the melting kettle, air compressor unit, hot compressed air lance, routing and crack sealing equipment and all related equipment such as fork lifts, hoists, and transport vehicles.

The melting kettle shall consist of a double jacketed oil bath kettle with thermometric controls which automatically control the product temperatures and with continuous agitation equipment to prevent localized variations in temperature. The kettle shall be equipped with two calibrated thermometers to monitor the temperature of the crack sealant and the temperature of the heat transfer oil.

The mechanical router shall be capable of producing the specified rout cross-section.

The compressed air unit shall be equipped with water and oil traps and must produce sufficient air volume and pressure to remove all debris from the cracks. It shall be capable of delivering a continuous stream of clean, dry air at 600 kPa and 4.5 m³/min.

Application equipment shall be capable of regulating the application of crack sealant directly to the road and shall be equipped with a thermometer to monitor the temperature of the material as it is applied.

3.14.4. CONSTRUCTION

3.14.4.1. Preparation

The work area shall be a maximum of 3 km in length. No Work shall be performed during rain or snow or when the pavement surface is wet. The crack sealant shall not be applied when the pavement temperature is below 10° Celsius. Unless otherwise directed by the PCR, all transverse cracks between 2 mm and 25 mm in width and longitudinal cracks between 2 mm and 12 mm in width shall be routed and sealed. The Contractor shall measure and record the length of every crack treated and inform the PCR of the total when nearing the estimated amount shown in the TA.

Prior to the application of crack sealant, the entire road surface shall be cleaned ensuring all loose material and moisture is removed from the routed cracks and surrounding areas. The routed cracks shall be treated with the hot compressed air lance until the pavement in the routed crack is dry and slightly darkened. There shall be a maximum time period of 2 minutes between cleaning and drying the routed cracks and the application of the crack sealant.

Cracks shall be routed to the applicable cross-section shown on the typical drawing keeping the crack in the centre of the rout cross-section.

3.14.4.2. Routing and Sealing

Crack sealant shall be heated and applied in accordance with the manufacturer's recommendations. Routed cracks shall be filled with crack sealant such that upon cooling, the filled crack is as shown on the Drawings. Excessive crack sealant shall be removed from the pavement surface immediately following application. Traffic shall be kept off sealed cracks until the crack sealant has cured. At locations such as intersections where this is not practical, the Contractor shall prevent tracking by applying a blotting agent to the crack sealant. When a blotting agent is used, it shall not be applied until the sealant has cooled sufficiently to prevent inclusion of the blotting agent into the sealant.

3.14.4.3. Finishing and Acceptance

Evaluation of the Work will be based on a visual inspection by the PCR. To be acceptable, the Work must conform with the following:

- All routed cracks conform with the specified rout profile,
- The rout conforms to the path of the crack with no part of the crack outside or touching the edge of the rout cross-section,
- All routed cracks have been sealed, and
- At least 95% of the cracks treated have been filled with an adequate amount of crack sealant material.

Failure to comply with the acceptance criteria will result in the Contractor re-treating all failed cracks at his own expense.

3.14.5. MEASUREMENT AND PAYMENT

Measurement will be made in lineal metres of cracks for which crack routing and sealing has been performed.

Payment will be made at the unit price bid per lineal metre for **Items A9, B9, C9 “Crack Sealing and Routing”** of Annex B – Basis of Payment. This payment will be full compensation for routing, cleaning and drying the cracks, cleaning the pavement surface, supplying and applying the crack sealant, Quality Control and traffic accommodation.

3.15. MANHOLES, CATCH BASINS, AND VALVES

3.15.1. GENERAL

As directed by the PCR, the height of existing manhole, catch basin and water valve frames and covers shall be adjusted to match the elevation of a new surface by means of bricks and mortar, or precast risers and mortar, or cast iron extension rings as directed by the PCR.

The maximum amount of adjustment allowed using bricks, risers or extension rings is 300 mm. Adjustments in excess of 300 mm will require alterations of the manhole, catch basin or water valve barrel in conjunction with adjustment of the frame and cover.

Prior to placing the surface course, the Contractor shall raise the manholes and valves to the expected finished pavement surface elevation. The manhole frames and covers shall be set to conform to the established cross slopes and grades of the pavement surfaces.

Adjustments to the manholes shall be made using the types of materials and workmanship used in constructing the original structures.

This work will only be required where asphalt patching or overlay work impacts manholes and catch basins.

3.15.2. CONSTRUCTION

Mortar must be used to set the frame and between each adjustment unit section. The thickness of mortar shall be such that when the adjustment unit sections and/or frame abut, mortar is squeezed out.

Under this item, the Contractor will be required to:

- Parge the inside wall of the adjustment unit sections
- Parge the joint between adjustment unit and catch basin frame
- Cut clean and parge catch basin laterals at the inside wall of pre-cast frame
- Parge under drains and defects in the catch basin structure

- Encase joint between adjustment unit and catch basin frame in 32MPa concrete.

Where frames and lids are damaged prior to construction, the Contractor will supply new catch basins lids and frames. Damaged catch basin frames and lids will be removed and disposed at an appropriate off-site location by the Contractor.

When required, the Contractor shall backfill the hole around the manhole/catch basin with imported crushed granular fill per section 3.7, Backfill prior to placing asphalt patching or overlay.

Any catch basin that does not open as intended will be considered incomplete and will not be eligible for payment until repaired.

Any catch basin that contains construction debris will be considered incomplete and will not be eligible for payment until debris is removed and disposed.

3.15.3. MEASUREMENT AND PAYMENT

Measurement of adjustments for manholes, catch basins and valves will be made by each unit adjusted to a maximum of 300 mm.

Payment for this work will be made at the unit price bid for **Items A10.a, B10.a, C10.a “Adjustment of Manholes” of Annex B – Basis of Payment**. The unit price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the PCR.

Payment for this work will be made at the unit price **Items A10.b, B10.b, C10.b “Adjustment of Catch Basins” of Annex B – Basis of Payment**. The unit price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the PCR.

Payment for this work will be made at the unit price bid for **Items A10.c, B10.c, C10.c “Adjustments of Valves” of Annex B – Basis of Payment**. The unit price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the PCR.

Measurement for Supply and Install Catch Basin Lid and Frame will be made by each unit supplied and installed.

Payment for this work will be made at the unit price for **Items A10.d, B10.d, C10.d “Supply and Install Catch Basin – Lid and Frame” of Annex B – Basis of Payment**. The unit price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the PCR.

3.16. CULVERTS

3.16.1. GENERAL

The Work consists of excavation, removal, supply of galvanized corrugated steel pipe (CSP), supply of all necessary couplers and appurtenances, grading, supply and placement of bedding material, backfill, mitering ends, grading, material testing and reinstating riprap at inlets and outlets. Full Depth Asphalt Removal will be in accordance with Section 3.8.

3.16.2. MATERIAL

The Contractor shall ensure that the supply and fabrication of all galvanized CSP culverts and pipe arches, including couplers and appurtenances, are in accordance with the latest edition of

Canadian Standards Association (CSA) G401 Specification. Previously installed pipe shall not be used unless it is being reinstated in the same location.

All pipe supplied shall be clearly marked with the following information at intervals of not more than 3 m.

- Manufacturer's Name or Trade Mark
- Nominal Thickness and Type of Metal
- Plate/Metal Coating (for non-standard coating)
- Specification Designation
- Plant Designation Code
- Date of Manufacture

Contractor shall provide slopped end sections meeting AT Specifications, or by prior written approval from PCR, Contractor may cut and grind all edges to remove burrs and reapply any damaged protective coating with appropriate material in accordance with CSA G401 and to the satisfaction of the PCR.

Spirally corrugated metal pipe shall have ends recorrugated to provide annular corrugations for couplers. Annular corrugated couplers for pipe greater than 300 mm in diameter shall be of sufficient width to cover at least two outside crest corrugations on each recorrugated end. Coupler bands for pipe greater than 800 mm in diameter shall have a minimum of three bolts.

3.16.3. EXCAVATION AND PREPARATION OF BASE

Excavation for the culvert base shall be to a depth of not less than 0.3 metres below the invert grade, and shall be of sufficient width to permit assembly of the pipe and the operation of compaction equipment on either side of the pipe. The width of the culvert bed shall be three (3) times the culvert diameter and free of all soft, yielding or unsuitable material to the satisfactory of the PCR.

Excavated material shall be replaced with gravel or other acceptable material to provide a firm foundation of uniform density throughout the entire length of the pipe. Contractor shall compact the exposed surface to uniform density. The Contractor shall then construct the culvert bed to the established elevation using gravel material or other material acceptable to the PCR. The culvert bed shall have a minimum slope of 0.5 % unless otherwise authorized by PCR.

Where gravel bedding or backfill is used, impervious, compacted clay cut-offs shall be constructed at both ends of the culvert as specified by AT.

3.16.3.1. Removal, Salvage and Reinstallation of Existing Culverts

Where removal and salvage of existing culverts or drainage structures from the roadbed, ditches, or other waterways is specified, the Contractor shall carefully excavate, remove and store the material at locations suitable to the PCR. Salvaged culverts shall be reinstalled in accordance with these specifications.

3.16.3.2. Removal, Disposal and Replacement of Existing Culverts

Where removal, disposal and replacement of existing culverts is specified, the Contractor shall remove and dispose of the material at locations acceptable to the PCR and supply new CSP culverts of the same size, unless otherwise directed by PCR, and meeting these specifications.

3.16.3.3. Culvert Installation and Removal on Roadways in Service

Where culvert installation or removal must take place on roadways that must remain in service during construction, the Contractor shall carry out their installation by working on one half of the roadway while maintaining, a flagperson controlled and adequately signed traffic flow on, the other half. Details of all proposed traffic accommodation methodologies shall be provided in the Contractor's Traffic Accommodation Strategy.

3.16.4. INSTALLATION

The culvert shall be installed on the prepared base, true to the existing lines and grades unless otherwise established by the PCR. Separate sections shall be securely joined together in accordance with the Manufacturer's instructions. Coupler bands shall be used for metal unless otherwise specified. At all coupling and joint areas depressions shall be constructed in the culvert bed so that the pipe is uniformly supported along its entire length. The Contractor shall use due care when installing the culvert to avoid damaging the material. Damaged culvert materials shall be removed and replaced by the Contractor at their own expense.

3.16.5. BACKFILLING

Backfill under the haunches and immediately adjacent to the culvert extending from the culvert base up to an elevation of 30 percent of the vertical height of the culvert shall be comprised of select gravel or soil material, as directed by the PCR. Backfill immediately adjacent to the culvert above this level shall be comprised of select backfill material.

All backfill material shall be free from frozen lumps and organic material. Backfill within 300 mm of the culvert wall shall be free from stones of diameter larger than 80 mm. All backfill material shall be placed in layers not exceeding 0.15 m in depth. Each layer shall be thoroughly compacted at optimum moisture content by means of pneumatic or other mechanical tamping equipment. Backfill and compaction layers shall be brought up simultaneously and evenly on both sides of the culvert filling all corrugations and ensuring firm contact with the entire bottom surface of the pipe. This compaction procedure shall be continued until the backfill reaches a minimum elevation of 0.3 m above the top of the pipe, or greater, as determined by the PCR, if necessary to carry the weight of construction equipment without damage to the culvert.

Backfilling of the remainder of the culvert excavation, beyond the immediate region of the culvert, shall be carried out in accordance with Section 3.7. Compacting equipment shall be operated parallel to the longitudinal axis of the culvert, until sufficient fill has been placed to proceed with construction of the embankment in the normal manner. The remaining construction of the grade embankment over the installation may then proceed in accordance with Section 3.7.

3.16.6. RIPRAP

Immediately following completion of culvert installation, riprap at inlets and outlets shall be reinstated to approval of PCR.

3.16.7. MEASUREMENT AND PAYMENT

3.16.7.1. Removal, Salvage and Reinstallation of Existing Culverts

Measurement for the excavation, removal, salvage and reinstallation of existing culverts and sloped ends, will be made in lineal metres based on the total invert length of pipe removed and reinstalled.

Payment will be made at the unit price bid per metre for **Items A11.a, B11.a, C11.a “Removal, Salvage and Reinstallation of Existing Culverts”** of Annex B – Basis of Payment for an average sized culvert of 600 mm. No reduction for smaller, nor increase for larger, to the unit price will be made for culverts not measuring 600 mm. This payment will be full compensation for excavating, removing and salvaging the culvert, preparing the culvert bed, reinstalling the pipe, backfilling to base of road surface, the replacement of riprap, and all materials, labour, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the PCR.

When a culvert is identified by the PCR to be salvaged and the culvert is damaged by the Contractor during the removal operations due to their negligence, the Contractor shall replace the damaged culvert at their own expense.

3.16.7.2. Removal, Disposal and Replacement of Existing Culverts

Measurement for the removal, disposal and replacement of existing culverts, will be made in lineal metres based on total invert length of culvert installed.

Payment will be made at the unit price bid per metre for **Items A11.b, A2.11b, B11.b, C11.b “Removal, Disposal and Replacement of Existing Culverts”** of Annex B – Basis of Payment for an average sized culvert of 600 mm. No reduction for smaller, nor increase for larger, to the unit price will be made for culverts not measuring 600 mm. This payment will be full compensation for excavating, removing, disposing of all the culvert pipe material, supplying all culvert pipe materials including couplers and appurtenances, preparing the culvert bed, installing the pipe, backfilling to base of road surface, the replacement of riprap, and all labour, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the PCR.

3.16.7.3. Granular Material for Culverts

Supply, haul and testing in accordance with AT specifications of granular material for backfill, bedding or clay cutoffs will be considered incidental and no separate or additional payment will be made

3.16.7.4. Culvert Installation and Removal on Roadways in Service

Where culverts are installed using staged construction, all costs associated with staging the work will be considered incidental and no separate or additional payment will be made.

SECTION 4 – Appendices

Appendix A - Asphalt Repair: Localization Key Plan

Appendix B - Typical Figures

Appendix C – Parks Canada Work Camp Regulations