

**STANDARD SPECIFICATIONS  
FOR  
HIGHWAY MAINTENANCE**

**EDITION 5**

**MARCH 2010**

**Government  
of Alberta ■  
Transportation**

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FOR  
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MARCH 2010**

**PREPARED BY  
ALBERTA TRANSPORTATION  
EDMONTON, ALBERTA**

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**Executive Director, Technical Standards Branch,**  
**Alberta Transportation.**

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## 51.1 DEFINITIONS AND INTERPRETATION

All definitions, employee titles and Department descriptions are subject to change based on prescribed operational parameters.

### 51.1.1 ACTIVITY

"Activity" shall mean the amount of related Work that applies to a specific roadway maintenance operation and may involve one or more bid items.

### 51.1.2 BID ITEM

"Bid Item" shall mean the quantity of Work for which a single unit price is paid.

### 51.1.3 CONTRACT

"Contract" shall mean the written agreement covering the performance of the Work and the supplying of labour, equipment and material required to complete the Work, and shall include, without limiting the generality of the foregoing, the Contractor's Proposal, Security, Plans, Specifications, Special Provisions, notices, supplemental specifications, specification amendments and all supplemental agreements required to complete the Work.

### 51.1.4 CONTRACTOR

"Contractor" shall mean the person agreeing to perform the Work set out in the Contract.

### 51.1.5 CONTRACT INSPECTOR

"Contract Inspector" shall mean the agent or official assigned to the Work by the Engineer, to perform the functions described in this document.

### 51.1.6 CONTRACTOR'S PROPOSAL

"Contractor's Proposal" or "Proposal" shall mean the document submitted by the Contractor in response to the Department's Request for Proposals.

### 51.1.7 DEPARTMENT

"Department" shall mean Her Majesty the Queen in right of Alberta, as represented by the Department of Transportation.

### 51.1.8 ENGINEER

The "Engineer" shall mean the person designated by the Minister to administer Contracts for Maintenance Work, and shall include a person authorized by the Engineer to perform, on his behalf, any of his functions under the Contract.

51.1.9 IMPLIED PROVISIONS

In the Contract:

- (a) words importing male persons include female persons and corporations;
- (b) words in the singular include the plural, and words in the plural include the singular;
- (c) the applicable law shall be the laws in force in the Province of Alberta;
- (d) time shall be of the essence; and
- (e) headings and subheadings are not substantive and are inserted for reference only.

51.1.10 INCIDENTAL(S)

"Incidental(s)" is a term used in payment clauses throughout the specifications and special provisions and, unless specified otherwise, refers only to minor items of work or materials not specifically mentioned but necessary for completeness.

51.1.11 MATERIAL

"Material" shall mean all or any part of the commodities or other items used or expended in the prosecution of the Work and includes materials furnished by the Contractor or by the Department for use by the Contractor.

51.1.12 MINISTER

"Minister" shall mean the Minister of Transportation for the Province of Alberta or his authorized representative.

51.1.13 OPERATIONS MANAGER

"Operations Manager" shall mean the agent or official assigned to the Work by the Engineer, to perform the functions described in this document.

51.1.14 PERSON

"Person" shall include a corporation or a partnership and the heirs, executors, administrators and/or other legal representatives of a person.

51.1.15 PLANS

"Plans" shall include all drawings or reproductions of drawings provided by the Department and pertaining to the Work.

51.1.16 PROSPECTIVE CONTRACTOR

"Prospective Contractor" shall mean any individual, partnership, or corporation submitting a Proposal for the Work.

51.1.17 SPECIFICATIONS

"Specifications" shall include all specifications and Plans and the directions, schedules, Special Provisions and requirements contained herein, together with all written agreements made or to be made, pertaining to the method and manner of performing the Work, or to the quantities or quality of Material to be furnished under the Contract.

51.1.18 SURETY

"Surety" shall mean the person bound with the Contractor to provide security, respectively, for:

- (a) Payment to the Department in the event of default or Contract termination.
- (b) Payment in full for all labour and materials used or reasonably required in the performance of the Contract.

51.1.19 WORK

"Work" shall mean all or any part of the work to be performed by the Contractor under the Contract, as directed by the Engineer, whether complete or incomplete, and any or all of the equipment, Material and labour supplied by or for the Contractor.

51.1.20 WORK ORDER

"Work Order" shall mean a written document which identifies a component of the Work to be performed by the Contractor, the bid items to be used, and the required completion date or response time.

## 51.2 GENERAL

### 51.2.1 SCOPE OF WORK

This Specification sets out the general requirements for the performance of maintenance operations on roadways and where applicable, vehicle inspection stations, roadside turnouts, park roads, rest areas and environmental structures under the jurisdiction of the Minister of Transportation within the Province of Alberta. The requirements for maintenance will be identified jointly by the Department and the Contractor and the Work required will usually be defined and issued to the Contractor through a Work Order. However, the Contractor shall respond directly to emergency situations relating to the safety of the travelling public.

The limits of the Contract will be specified on a geographical basis, as indicated in the Contract documents. The Work will not normally include capital construction or pavement rehabilitation unless directed by the Engineer.

The Engineer reserves the right to modify the scope of the roadway systems and other assets to be maintained under the Contract. An increase or reduction in scope will generally result from a change in designation and transfer of the road authority to or from other Government agencies. However, any corresponding change in quantities shall not be considered as a waiver of any term or condition of the Contract, nor shall any changes be made in the Contract unit prices on account of any such alterations unless the Department deems the alterations are significant enough that changes are warranted.

### 51.2.2 EXAMINATION OF WORK

#### 51.2.2.1 **Prospective Contractor's Investigation**

The Prospective Contractor shall examine the Plans, Specifications and Contract forms and carefully investigate and satisfy himself of every condition affecting the Work, including the site conditions and the labour and material to be provided. Submission of a Proposal shall be conclusive evidence that the Prospective Contractor has made such investigation and assumes all risk regarding conditions affecting the Work.

#### 51.2.2.2 **Hierarchy Of Documents**

In the event of discrepancies, the hierarchy of documents shall be as follows, in descending order:

- special provisions
- specification amendments
- applicable appendices contained in the document entitled Dispute Resolution Process for Government of Alberta Construction Contracts, Edition 1, 1997
- plans
- general specifications
- technical specifications
- mobilization plan
- work execution plan

In the event of a difference between scaled dimensions on Plans and the figures written thereon, the figures shall govern. In the event that two or more Plans show conflicting information, the information on the most recently dated Plan shall govern.

### 51.2.2.3 **Deviations From Plans**

No deviation from the Plans or the approved working drawings will be permitted without a written order of the Engineer.

### 51.2.2.4 **Error or Omission**

In the event of an error or omission of any detail from the Specifications or Plans, only the best general practice, in the opinion of the Engineer, is to prevail, and only Material and workmanship of the highest quality are to be used.

## 51.2.3 CONTRACTOR'S PROPOSAL

The Contractor's Work Execution Plan, Environmental Management Plan, Safety Management Plan and any other documentation submitted as part of the Contractor's Proposal shall form part of the Contract.

The Contractor shall maintain the currency of these documents and shall notify the Engineer of any occurrence which results in a change to these documents.

The Contractor shall at any time when requested, provide the Engineer with evidence that the Contractor is able to finance the remainder of the Contract.

## 51.2.4 WORK OUTSIDE CONTRACT BOUNDARIES

The Engineer may direct the Contractor to perform Work outside the specified Contract area boundaries. The Work will be limited to Contract-related items. The Engineer may direct the Contractor to perform this Work with other contractors. Such Work will normally be required for emergency situations in which the safety of the travelling public is an issue or protection of the highway infrastructure is required.

Payment for any Work outside the Contract area boundaries will be at the rate specified in the unit price schedule for the Contractor performing the Work. Any additional cost such as travel time, will be paid in accordance with Section 51.2.28, Extra Work and will be identified when the Engineer orders the Work.

## 51.2.5 CONTRACTING OF OTHER WORK

The Minister reserves the right to contract for the performance of other work at any time within the geographical area of the Contract. Such contracts may include types of work which are included or identified in this Contract. The types of work which may be completed through these separate contracts or agreements include but are not limited to the following:

- (a) Crushing and stockpiling of aggregate,
- (b) Traffic signal maintenance,
- (c) Capital construction work, including major pavement rehabilitation, major seal coat surfacing, line painting, guardrail construction, supply and installation or replacement of culverts, major bridge work, installation of Jersey Barriers or permanent highway signing relating to this construction, and
- (d) Significant erosion control or other environmental improvements.

## 51.2.6 GUARANTEED ANNUAL PAYMENT

### 51.2.6.1 **Minimum and Average Annual Payment**

The Department guarantees a total minimum and average annual payment to the Contractor based on projected costs as calculated in Section 51.2.6.2, Calculating Minimum and Average Annual Payments and on the following basis:



For full years of the Contract, a minimum annual payment of 75% (Exclusive of escalation/de-escalation).

Notwithstanding the minimum annual guarantee of 75% (Exclusive of escalation/de-escalation), the Contractor is assured of an average annual payment of 85% (Exclusive of escalation/de-escalation) over the term of the Contract.

These amounts are based on a complete fiscal year from April 1 to March 31 and will be prorated for partial fiscal years depending upon commencement and completion dates of the Contract.

#### 51.2.6.2 **Calculating Minimum and Average Annual Payments**

In calculating the minimum and average annual payments, the total yearly projected revenue will be based on the first year Provisional Quantities (shown in the Unit Price Schedule) multiplied by the bid price plus the following Fixed Operating Cost bid items:

- Truck Availability
- Operator Availability
- Highway Maintenance Work
- Indirect Operating Costs
- Indoor Heated Truck Storage

#### 51.2.6.3 **Work Quantities**

An Activity may be comprised of several bid items and used in several combinations to order the Work required. The Engineer will determine the bid items to be used in performing the Work for a specific Activity. The Contractor is advised that the unit price of the various bid items may be a factor considered by the Engineer when selecting the bid items for completion of the Work.

The Provisional Quantities identified in the Request for Proposal are presented at the bid item level and generally represent a typical complete Department fiscal year from April 1 to March 31. (The quantities are based on an average of typical previous winter quantities and projected summer quantities for the first year of the Contract). These Provisional Quantities are approximate only and will be used as a component of the evaluation of the Proposals.

The actual quantities of Work required for each bid item, each year, will be determined by the Engineer.

#### 51.2.7 **REJECTION OF PROPOSALS**

The Minister reserves the right to reject any or all Proposals.

Any or all Proposals will be rejected if there is reason to believe that collusion exists among the Prospective Contractors, and none of the participants in such collusion will be considered in future Proposals.

#### 51.2.8 **COMPETENCY**

Contracts will be awarded only to Prospective Contractors registered with the Service Alberta, Corporate Registry.

Contracts will not be awarded to any government agency, including but not limited to the government of Canada, the government of a province or territory of Canada, any agency thereof, or any municipality or other unit of local government within any province, Indian Reserve, Metis Settlement, or territory of Canada.

"Government Agency" means a branch, unit, subsidiary or other form of entity, owned or controlled by a government agency and includes any subsidiaries or entities owned or controlled by that agency.

#### 51.2.8.1 Safety Prequalification

Contracts will be awarded only to Contractors who, prior to the time fixed for receiving Proposals, have achieved accreditation/recognition or have enrolled in a safety certification program relevant to this industry and recognized by Alberta Human Resources and Employment, Workplace Health and Safety. Contractors who have not yet achieved accreditation in such a program, but have a "Temporary Letter of Certification" (T.L.C.), must achieve full certification within 6 months of signing the Contract.

The Department will verify the Contractor's compliance with this requirement through the Alberta Construction Safety Association.

It is the Contractor's responsibility to ensure that his registration in the program is properly documented with the Alberta Construction Safety Association, and the Department will assume no liability for errors or omissions by the Alberta Construction Safety Association in this regard.

During the progress of the Work, the Contractor shall complete monthly health and safety summary reports and submit these reports to the Operations Manager at the end of each month.

Annually, during the month of April, the Contractor and Operations Manager shall jointly complete the Project Completion Health and Safety Report.

The Department will provide copies of these forms to the successful Contractor.

The Contractor shall also ensure to his satisfaction that any subcontractors/owner-operators are able to comply with all health and safety requirements before commencing the Work.

#### 51.2.9 SECURITY

The successful Contractor shall furnish security, in a form satisfactory to the Minister, in the amount of:

- (a) \$250,000 per Contract Maintenance Area as a performance security to the Department in the event of Contractor default or Contract termination, as defined in 51.2.23, Default, to be paid to the Department as a pre-calculation of liquidated damages; and
- (b) \$500,000 per Contract Maintenance Area for payment in full of all claims for labour and Material used or reasonably required in the execution of the Contract.

#### 51.2.9.1 Performance Security

An irrevocable letter of credit, certified cheque, bank draft, money order or forfeit bond will be the form of security required for the performance of the Contract.

When irrevocable letters of credit are used, they shall comply with the following:

- (a) The irrevocable letter of credit shall be provided by a domestic chartered bank as listed in the Bank Act, Schedule A, Domestic Chartered Banks, Schedule B, Foreign Chartered Banks, or Alberta Treasury Branches.
- (b) Unless otherwise approved by the Engineer, the irrevocable letter of credit shall be worded the same as the sample in the Contract.

- (c) The irrevocable letter of credit shall be renewed annually, shall be in force throughout the term of the Contract, and shall contain an automatic renewal clause that will provide the Department with advance notice of non-renewal a full 90 days before the renewal date.
- (d) Should the Contractor fail to renew the irrevocable letter of credit, the Department may, without further notice, draw funds on the irrevocable letter of credit.

When forfeit bonds are used, they shall comply with the following:

- (a) Unless otherwise approved by the Engineer, the forfeit bond shall be worded the same as the sample in the Contract.
- (b) The initial term shall be for a minimum period of 2 years.
- (c) The forfeit bonds shall be subsequently renewed annually for a minimum of two year terms.
- (d) Should the Contractor fail to renew the bond, the Department may without further notice draw funds on the forfeit bond.

Irrevocable letters of credit, certified cheques, bank drafts, money orders or forfeit bonds will be released:

- (a) upon expiration of the Contract, or
- (b) in cases where Section 51.2.11, Contractor's Warranty applies, after the expiration of the warranty period, provided any repairs are completed to the satisfaction of the Engineer.

#### 51.2.9.2 **Labour and Materials Payment Bonds**

A labour and material payment bond will be the form of security required and shall comply with the following:

- (a) The initial term shall be a minimum of two years;
- (b) The bond shall be subsequently renewed annually for two year terms; and
- (c) The labour and materials bond shall remain in place for 120 days after completion of the Contract.

The Department will provide the Prospective Contractor with blank bond forms for completion.

If the bonds are renewed every two years are contractors still on the hook for work that was done two or more ago? With a six or seven year contract to have a labour and material bond used against you in year six or seven for some work done in year one or two would seem a little extreme.

#### 51.2.10 NOTICE OF CLAIMS INFORMATION

The Public Works Act (Alberta) applies to this Contract. The Builder's Lien Act (Alberta) does not apply. For the purposes of interpreting the "Notice of Claim" provision under Section 14 of the Public Works Act, the claim shall be deemed to be a claim under section 14(2) in which the notice of claim shall be sent by registered mail not sooner than 30 days nor later than 90 days after the last day on which the labour, equipment, Material or services were provided.

The Contractor shall post, at his project field office or other conspicuous location accessible to employees, subcontractors, truckers, material suppliers, et cetera, copies of the following:

- Standard Claim Form
- Bond Notice
- Section 14 of the Public Works Act regarding Notice of Claim
- Copy of this Section 51.2.10

These shall be protected in a legible condition for the duration of the Contract. Copies of these documents will be provided to the successful Contractor prior to commencement of the Work.

#### 51.2.11 CONTRACTOR'S WARRANTY

During the warranty period, the Contractor shall warrant the Work to be free from any defect or failure and to withstand climatic, maintenance and normal operational conditions. The warranty period for the Work shall be as specified in the Technical Specification applicable to the Work performed. The warranty period shall commence on the date of completion of the Work as determined by the Engineer.

The Contractor shall, at his own expense, repair any such defect or failure which occurs in the Work prior to the expiry of the warranty period. The Engineer and/or the Contractor will identify the warranty items during the warranty period, mark them out in the field and document the repairs required. The Contractor shall make these repairs promptly and in accordance with the method laid out in the original Work Order, and shall give the Engineer prompt notice of the repair performed.

The warranty period applies to the original work and once repaired in accordance with the Contract, the warranty period for the repaired work will not extend beyond the original expiry date. The repair of the warranty items will normally take place within the warranty period, the Engineer, however, may approve the repair work taking place outside the warranty period if the Contractor is delayed as a result of other Contract work.

If the Contractor fails to do the repairs promptly or to the satisfaction of the Engineer, the Engineer may then make other arrangements to have the repairs done, the cost of which shall be a debt due and owing by the Contractor to the Minister, which the Engineer will deduct from monthly progress payments due the Contractor or draw funds from the performance security provided by the Contractor.

#### 51.2.12 INSURANCE

The Contractor shall, without limiting his obligations or liabilities herein and at his own expense, provide and maintain the following insurances in compliance with the Alberta Insurance Act, and in forms and amounts acceptable to the Minister:

- (a) General Liability Insurance in an amount not less than five million dollars (\$10,000,000) inclusive per occurrence against bodily injury and property damage, including loss of use thereof. If this requirement is satisfied with a General Liability Wrap-up insurance policy, the Minister is to be a named insured on the policy.
  - Products and completed operations liability,
  - Owner's and contractor's protective liability,
  - Blanket written contractual liability,
  - Contingent employer's liability,
  - Personal injury liability,
  - Non-owned automobile liability,
  - Cross Liability with respect to additional insureds,
  - Employees as additional insureds,
  - Broad form property damage endorsement,
  - Operation of attached machinery,

- Sudden and accidental pollution,  
and where such further risk exists:
  - Blasting, Demolition, pile driving, caisson work or tunnelling, as applicable,
  - Elevator and hoist liability,
  - Towing/on hook coverage.
- (b) Automobile liability on all vehicles owned, operated or licensed in the name of the Contractor in an amount not less than five million dollars (\$5,000,000).
- (c) In the event the Contractor is responsible for operating and maintaining a Department owned ferry, its approach ramps and the general site area, including launching the ferry in the spring and dry docking it in the fall; Marine Protection and Indemnity insurance in an amount of not less than five million dollars (\$5,000,000) per occurrence to cover claims arising in connection with the ferry operation.

The Contractor shall provide the Engineer with a certified true copy of each policy prior to execution of the Contract. The Contractor shall also provide certified copies of the certificate of renewal of the policies, or certified copies of the replacement policies, as evidence that these coverages have been continued, for the duration of the Contract.

The Contractor shall ensure that products and completed operations coverage, as applicable, shall be in force for the duration of any warranty period.

All required insurance shall be endorsed to provide the Engineer with 30 days advance written notice of material change or cancellation.

The Contractor shall require and ensure that each subcontractor provide evidence of comparable insurance to that set forth in clauses (a) and (b) in an amount not less than five million dollars (\$5,000,000).

The Contractor is responsible for insuring his equipment against all risks of accidental loss or damage.

#### 51.2.13 DUE CARE, CLAIM SETTLEMENT AND HOLD HARMLESS

The Contractor shall hold harmless the Minister, his employees and agents from any and all claims, demands, actions and costs whatsoever, that may arise directly or indirectly out of any act or omission of the Contractor, his employees, agents or sub-contractors, in the performance of the Work.

The Minister shall hold harmless the Contractor, his employees and agents from any and all claims, demands, actions and costs whatsoever, that may arise directly or indirectly out of any act or omission of the Minister, his employees or agents in the performance of the Work.

Such hold harmless shall survive the Contract.

The Contractor shall ensure that his forces and those of all subcontractors use due care to ensure that no person is injured and no person's property damaged in the prosecution of the Work. Without restricting the generality of the foregoing, the Contractor shall, at his own expense, make such provisions as may be necessary to avoid any such injury or damage.

All claims for injury, loss or damage arising in connection with the Work will be referred to the Contractor who shall deal with each claim in a fair and reasonable manner. The Contractor shall respond to each claimant in writing, setting out the Contractor's position with respect to the claim.

If the Contractor settles the claim, he shall provide the Engineer with written proof that the matter has been resolved. If the Contractor is unable to settle the claim or considers the claim to be invalid, he shall provide the Engineer with written reasons for rejecting the claim.

It is the Department's intent that all claimants fully understand the claims resolution process. To assist the claimant in this regard, the Department has available an information pamphlet outlining the process. When contacted by a claimant, the department will provide a copy of the pamphlet to the claimant and then refer the claim to the Contractor. In situations where the Contractor is contacted by a claimant directly, the Contractor shall immediately advise the claimant that a pamphlet outlining the claims resolution process is available from the local Alberta Transportation Office. The Contractor shall then deal with the claim as described above.

The Engineer will refer unresolved damage claims of less than \$2,000.00 to an independent adjuster, who will decide on the validity and value of the claim. The adjuster will be appointed by the Department.

If the adjuster decides that the claim is unfounded, the Department will bear the cost of the assessment. In all other cases, the Contractor shall pay the adjuster's fee and the claim and provide the Engineer with written proof that he has done so.

The Department may retain from money due the Contractor the amount of each claim pending its resolution, including payment to the claimant and the adjuster, where applicable.

#### 51.2.14 AUTHORIZATION OF WORK

##### 51.2.14.1 **General**

The Work to be performed under the terms of the Contract will be identified by Activity, and for each Activity the bid items necessary to perform the Work will be specified. The Work to be undertaken may be identified by the following process:

- (a) The Engineer will identify and order the Work;
- (b) The Contractor identifies a requirement and makes a recommendation to the Engineer; or
- (c) The public identifies a requirement to the Contractor or Engineer.

The Engineer will approve the scope and nature of the Work to be performed with the exception of emergency work and re-establishment of critical traffic control signs, which will be dealt with in accordance with Section 51.2.14.3, Emergency Situations, and minor work which is covered in the Highway Maintenance Work bid item.

The Engineer will issue instructions to the Contractor for the performance of the Work. These instructions may be in the form of a written Work Order, written instructions, or verbal instructions.

##### 51.2.14.2 **Work Orders**

Work Orders, and the records of work and inspections, will be done using the Department's internet based Program Management Application (PMA). Typically, this requires computer systems and servers capable of using file transfer protocols, and may require personnel dedicated to distribute Work Orders; or compile, enter, and import work records captured on paper at the worksite.

Work Orders will be emailed to the Contractor and are also available for viewing and printing through PMA.

All Work and inspections completed (or in progress) by the Contractor shall be imported or entered into PMA detailing, but not limited to:

- Correct location by segment
- Date completed
- Bid item quantities
- Status of Work Order (complete or incomplete)
- Person reporting
- Any comments arising from the Work

Completed work shall be reported on a weekly basis as a minimum.

#### 51.2.14.3 Emergency Situations

Emergency situations will require very short response times by the Contractor and may include Work not specified in the Contract. The response to an emergency situation will be handled in either of the following ways:

- (a) When the Contractor observes an emergency situation or is contacted directly by emergency services such as the RCMP, local fire departments, Disaster Services or other similar agencies, or a member of the public regarding an emergency situation, the Contractor shall co-operate with the request and, when necessary, take reasonable steps to ensure safe accommodation of the travelling public and protection of Department assets. The Contractor shall immediately notify the Engineer of any such requests. After the emergency, a Work Order will be issued to the Contractor.
- (b) When the Department receives notification of an emergency situation, the Contractor's representative will be contacted and given verbal authorization to perform the Work. The Contractor shall respond to the emergency within the time specified by the Engineer. After the emergency, a Work Order will be issued to the Contractor.

The Contractor shall treat absence of or damage to critical traffic signs, in particular Stop and Yield signs, as an emergency situation. When the Contractor either observes or is informed by the public or notified by the RCMP of an emergency situation involving signage, the Contractor shall immediately take appropriate temporary measures, either installing a temporary sign or performing traffic control measures to ensure the safety of the travelling public, and immediately inform the Engineer of the occurrence and the corrective action taken.

#### 51.2.14.4 Haul of Material

The Engineer, prior to issuing a Work Order for the supply of Material which contains a bid item for haul, will require the Contractor to confirm the source of the Material and the haul distance to the Work site. The Engineer reserves the right to limit the distance the Contractor hauls Material to those sites identified in the Contractor's Proposal. Should the Contractor elect to haul Materials from other than the approved sites, all additional costs shall be borne by the Contractor.

#### 51.2.14.5 Examination of Work

The Contractor, upon receipt of an order to perform the Work, shall review the instructions given and satisfy himself that the quantities are reasonable to complete the Work, the warranty requirements are reasonable for work site conditions and the Work can be completed in the time allocated. The Contractor shall notify the Engineer of any conditions which will alter the authorized quantities.

#### 51.2.14.6 Work Planning

The Contractor will be given the flexibility to schedule the assigned Work to achieve efficiency in his operations. The Contractor shall comply with the specified completion dates for each Work activity to achieve Department priorities, and the Engineer will work with the Contractor to ensure that the overall balance of work is evenly distributed considering reasonably available resources during any given work period.

The Contractor shall provide a Work Plan for “major” specified programmable Work Activities and for other “minor” programmable Work Activities as mutually agreed. The Work Plan will be based on information provided by the Engineer. The Contractor will work with the Engineer to determine a schedule that meets the priorities of the Department as well as allowing for efficient operations by the Contractor. The Work Plan shall be approved by the Contractor and Engineer and reviewed on a regular basis, such as during the scheduled Operational Planning Meetings specified in Specification 51.2.41 Meetings, and shall update the Plan as required.

The Engineer shall issue Work Orders for the designated programmed Activities based on the approved Work Plan and will use the agreed upon completion dates for the Work Orders, which may differ from those identified in the Work Activity specification.

A “programmed” Activity is one in which the work can be clearly identified in advance, is typically a significant portion of the total maintenance work undertaken, and requires significant coordination of work crews across multiple areas (i.e. paver patching, crack sealing, line painting, gravel surfacing, etc., but not grader maintenance of gravel roads). “Reactive” work is that which varies considerably from year to year, both in timing and quantity, and cannot be reasonably programmed into a yearly schedule (ie, chemical vegetation control). “Routine” work is work such as grader maintenance which is required on a consistent basis in a given season, but varies in quantity from month-to-month.

The Work Plan will define the following items for the programmed Activities for all of the Contract Maintenance Areas in the Contract as a whole:

- a) Proposed Start Date – earliest date the Contractor can reasonably start
- b) Proposed Completion Date – latest date that achieves mutual objectives of Contractor and Department - requires mutual agreement
- c) Anticipated schedule - Between the Proposed Start Date and Proposed Completion Date. (for each CMA and approximate scheduling of crews. It may take one or more rounds to complete a given Work Activity in a given CMA.)
- d) Quantity of Work
- e) Work Priorities – scheduled so that the highest priority items are completed first or as otherwise mutually agreeable.
- f) Operational Issues – issues that the Contractor is aware of that will affect the order in which the work is completed.

The Contractor shall inform the Engineer of changes to the schedule between the Proposed Start Date and Proposed Completion Date as early as possible. If the changes in schedule between the Proposed Start Date and Proposed Completion Date affect Department priorities, the Contractor and Engineer shall review the changes and update the Work Plan. Adjustments to Work Order Completion date are to be handled in Accordance with specification 51.2.14.12.

#### 51.2.14.7 Inspection by the Department

Upon notification that the Work has been completed, the Engineer may inspect the Work to confirm that it has been performed in accordance with the Specifications and/or to verify bid item quantities submitted by the Contractor.



The Engineer, subject to the availability of the Contractor's staff, may issue a Work Order to the Contractor to provide labour to assist in the verification of the completed Work. The Work Order will specify the response time and the duration of the Work. Payment will be made in accordance with Section 51.2.28, Extra Work.

#### 51.2.14.8 **Measurement and Verification of Quantities for Payment**

The Contractor is responsible for measuring quantities of Work for payment at his cost for the purpose of submitting crew and work sheets.

##### 51.2.14.8.1 Establishing Quantities by the Engineer

The Engineer will determine the method of establishing the quantities of Work. The Engineer may use, but is not limited to, one of the following methods to establish final quantities for payment:

- (a) Quantities measured in advance of performing the required Work;
- (b) Agreement with the Contractor on the quantities or hours required to complete the Work, reached in advance of performing the Work;
- (c) Require the Contractor to provide a time-stamped photo or videotape or other means of illustrating Work in progress or Work completed;
- (d) Measure completed Work by the Engineer; or
- (e) Other methods agreed to by both parties.

##### 51.2.14.8.2 Measurement by the Contractor

In special circumstances, the Contractor may be required to accurately measure and calculate the quantities of work and provide details to the Department for verification.

The requirement for additional verification measurements and calculations by the Contractor, including the method to be used and the degree of accuracy required, will be indicated on the Work Order. Payment for measuring and calculating quantities of work will be made in accordance with Section 51.2.28, Extra Work.

#### 51.2.14.9 **Quantity Variations**

The Contractor shall monitor and track the quantities and hours as the Work is being performed. Prior to exceeding specified quantities or hours of work, the Contractor shall obtain approval from the Engineer. The Engineer will determine if the Work is to continue and the original quantities exceeded.

The Department will not pay for Work in excess of that specified in the Work Order unless the Contractor has obtained prior authorization from the Engineer.

#### 51.2.14.10 **Contractor Certification of Work in Progress or Completed Work**

When the Contractor has completed the Work or when the Engineer has authorized Work of extended duration, the Contractor shall inform the Engineer by submitting documentation which certifies that the Work has been performed or completed in accordance with the terms and conditions of the Contract. The Engineer will specify the form the Contractor's certification will take for Work in progress or completed Work however, typically the form required will be the electronic work sheet and/or invoice.

The Contractor shall, upon request from the Engineer, provide supporting evidence that the Work has been performed.

#### 51.2.14.11 Compensation for Accelerated Scheduling of the Work

When the Work Order specifies a "reduced" completion time, the Engineer will also pay the Contractor the Reduced Completion Time Premium specified under the relevant bid item. This premium payment will only be made if the Contractor complies with the reduced completion time ordered. Premium payments shall apply only once for all bid items related to the specified Work on the Work Order, and will be made at the rate for the first eligible work performed.

Response time is the time within which the Contractor shall have mobilized the necessary work force and be in route to the work site. When Work Orders require a "reduced" response time, the Engineer will pay the Contractor the Reduced Response Time Premium specified under the relevant bid item. This premium payment will only be made if the Contractor complies with the reduced response time ordered. Premium payments shall apply only once for all bid items related to the specified Work on the Work Order, and will be made at the rate for the first eligible work performed.

#### 51.2.14.12 Adjustment to Work Order Completion Date

A Work Order will be deemed completed when the Work has been completed in a manner satisfactory to the Engineer, and the completed crew sheet has been submitted to the Engineer for approval.

When completion of the Work is delayed through no fault of the Contractor, the Contractor shall provide the Engineer with written notice of the existence of circumstances over which he has no control and which affect completion of the Work. The Engineer may, at his discretion, extend the completion date specified in the Work Order provided that in the Engineer's opinion the Contractor has diligently proceeded with the Work and has applied all reasonable means and methods to complete it.

#### 51.2.14.13 Cancellation of a Work Order

The Engineer reserves the right to cancel a Work Order at any time. Payment will be made to the Contractor for acceptable Work performed prior to cancellation and may include additional compensation to the Contractor for any additional substantiated costs as a result of the cancellation while the Work was in progress. The type of situation that may result in cancellation of a Work Order includes but is not limited to the following:

- (a) The scope and magnitude of the Work has changed excessively.
- (b) Department fiscal year-end of March 31 has been reached.
- (c) The term of the Contract has expired.

### 51.2.15 PAYMENT AND HOLDBACK

#### 51.2.15.1 Payment

The payment made to the Contractor in accordance with the Contract shall constitute full compensation for the Work completed and in place, including the furnishing of all Material, tools, machinery, equipment, labour and incidentals necessary to complete the Work as well as any and all expenses incurred by reason of any cause except as otherwise provided in this document.

Payment for travel time to and from the work site, is considered incidental to the Work, except as otherwise provided in the Technical Specifications.

Payment will be based on the quantities indicated on the crew and snow removal and ice control Worksheets submitted by the Contractor to the Department following completion of the Work. The Worksheets shall be imported or entered into PMA at a minimum of a weekly basis. The Department will determine payment for Work performed in accordance with Contract requirements. Payment may include portions of Work completed on Work Orders of extended duration.

The Department will prepare monthly progress estimates summarizing the Work completed during that month and shall make the necessary payment within 30 days.

#### 51.2.15.2 **Holdback**

The Department will not normally retain holdback from payment made for completed Work. However, the Department reserves the right to retain holdback in the total amount of any outstanding third-party claims, deficiencies in the Work, overpayment, or any other items identified.

#### 51.2.15.3 **Release of Holdback**

When a holdback has been taken, the Department will release the holdback to the Contractor provided that the reasons for retaining the holdback are no longer applicable and the following have occurred:

- (a) The outstanding third-party claims filed with the Department have been removed.
- (b) There is no recovery required from the Contractor on any account, including overpayment, or penalty.
- (c) The Department has received the Workers' Compensation Board clearance and a statutory declaration, satisfactory to the Engineer, indicating "No Exceptions."

If the Contractor fails to meet his obligations with respect to any of these items, the Department may use holdback funds to rectify the deficiency, in accordance with the terms and conditions of the Contract and the Public Works Act.

#### 51.2.16 MOBILIZATION AND DEMOBILIZATION

The Contractor shall at his own cost have his manpower and equipment mobilized and ready to commence Work on the date and time specified in the Contract for Time of Commencement.

When a Contract Maintenance Area changes hands, the Outgoing and Incoming contractors shall jointly supply the Engineer with a detailed schedule for the transfer of any maintenance yards within the Contract Maintenance Area. The schedule shall be submitted at least two months prior to commencement of the new contract.

Upon expiration of the Contract, the Outgoing Contractor shall, at his own expense, demobilize his manpower and equipment from all sites except those of which he is continuing to retain ownership, on a mutually agreed schedule. The Outgoing Contractor and the Engineer shall coordinate the transfer of materials from any sites the contractor is retaining at least 30 days prior to the expiration of the contract.

#### 51.2.17 INDIRECT OPERATING COSTS

The Indirect Operating Costs bid item is included in the Unit Price Schedule to cover Contractor's costs that are not specifically covered in the Technical Specifications. Such costs shall include but are not

limited to the cost of direct and indirect supervision, overhead, facilities, financing, security, attending meetings, and obtaining necessary permits and certifications.

Payment will be made in the amount bid per month, regardless of the volume of Work performed.

#### 51.2.18 GOODS AND SERVICES TAX

This is to certify that the property and/or services ordered/purchased hereby are being purchased by Alberta Transportation which is part of the Alberta Crown or is listed as a tax free Alberta Government agency, and are therefore not subject to the Goods and Services Tax.

This exemption applies to all payments made by the Department to the Contractor under this Contract. The unit prices bid shall exclude any allowance for the goods and services tax.

#### 51.2.19 PAYMENT FOR LABOUR AND MATERIAL

The Contractor shall promptly pay or ensure that prompt payment is made for all labour, services, equipment, supplies and Material used for, on or about the Work, including any sum due from the Contractor, any subcontractor or any person, for the labour or services of any subcontractor, foreman, worker or other person, or for the use of plants, machinery or camp supplies. In the event of failure by the Contractor at any time to do so, or if the Department has reason to believe that such payments will not be made promptly, the Department may retain, out of any money due on any account to the Contractor from the Department, such amount as the Engineer may deem sufficient to satisfy the same, giving the Contractor notice of such claims, and requesting him to settle them directly and withholding the balance until the claims are satisfied. The Department may pay directly to any claimant such amount as the Engineer determines is owing, paying the Contractor the balance.

When the liabilities of the Contractor under the Contract exceed the money owed to him on any account by the Department, the Contractor or the Surety shall pay all such claims as are certified by the Engineer to be correct.

Upon request and in a form satisfactory to the Department, the Contractor shall provide the Engineer with a statutory declaration, certifying that all payments have been made or providing details of accounts which are outstanding in excess of 30 calendar days.

#### 51.2.20 INNOVATION

This section applies to all innovations initiated and developed by the Contractor and which are identified as such by the Contractor at the time of their submission to the Engineer.

The Contractor may submit to the Engineer in writing, innovations for modifying the Plans, Specifications or other requirements of the Contract for the purpose of reducing the total cost of the Work without reducing design capacity or quality of the finished product or process. The Engineer is not obligated to approve an innovation. If accepted by the Engineer, net savings to the Department resulting from the innovation will be shared by the Contractor and the Department on a 65% Contractor and 35% Department ratio for the remainder of the Contract term.

The following information shall be provided with each innovative proposal:

- (a) a statement that this proposal is submitted as an innovation;
- (b) a description of the difference between the existing Contract requirements and the proposed innovative change;

- (c) a statement concerning the basis for the innovation and benefits to the Department, together with an itemization of the Contract items and requirements affected by the innovation;
- (d) separate detailed cost estimates for both the existing Contract requirements and the proposed innovative change;
- (e) an itemization of plan details, design standards or specifications to be changed if the innovation is adopted;
- (f) a statement of the date by which approval must be issued to obtain the total cost reduction of the innovation during the remainder of the Contract; and
- (g) if the Contractor has other contracts with the Department, a statement to which contracts the innovation will apply.

The Department will establish a review committee for processing the innovation in whole or in part. The innovation shall be submitted to the Department through the office of the local Regional Director who will forward the submission to the review committee. The Department will not be liable to the Contractor for failure to accept or act upon any innovation submitted pursuant to this provision, nor for any delays to the Work attributable to any such proposal. Until a proposal is adopted by the Department, the Contractor shall remain bound by the terms and conditions of the Contract. When an innovation has not been adopted by the date upon which the Contractor's proposal specifies that a decision should be made, or such other date as the Contractor may subsequently have specified in writing, evaluation of the proposal shall be terminated unless the Contractor extends the approval date.

If an innovation is accepted by the Department, the Contract will be modified to indicate the estimated net savings agreed upon, any adjustment in the unit prices and that the net savings be divided between the Contractor and the Department at a 65% Contractor and 35% Department ratio. The Contractor shall absorb all costs incurred in preparing an innovation for submission to the Engineer. Costs incurred by the Department in evaluating, approving or rejecting, and administering an innovation will be borne by the Department. The Department reserves the right to include any term and condition it deems appropriate for implementation of the innovation. The Contractor's sixty five percent share of the net savings shall constitute full compensation for affecting all changes pursuant to the innovation.

The actual cost of the revised Work, will be paid on current progress estimates. In addition, the Contractor will be paid on a lump sum basis by a separate item, one-half of the difference (net savings) between the cost of the original Contract Work and the final cost of the revised Work in the following manner:

One-half of the Contractor's share, which is equal to 32.5% of the estimated net savings for a 1-year period commencing on the date on which the innovation was approved, will be paid to the Contractor upon approval of the innovation.

The remainder of the first year's savings due the Contractor will be paid when that Work for the first year is completed and will be determined from actual quantities completed.

In subsequent Contract years, the Contractor will be paid his yearly share of the savings via an adjusted unit price to reflect the shared cost savings resulting from the new process.

If the Contractor submits an innovation essentially the same as one approved for another Department contract or if the Department wishes to adopt an innovation being used on another Department contract, any required change to the Contract shall be in accordance with Section 51.2.27, Changes in the Work.

All benefits accruing to the Contractor as a result of an innovation, will cease upon termination of the Contract.

The Department reserves the right to adopt an innovation for general use in contracts administered by the Department when it determines that the innovation is suitable for application to other contracts without obligation or compensation of any kind to the Contractor who developed the innovation.

#### 51.2.21 TEMPORARY SUSPENSION OF WORK

##### 51.2.21.1 **Engineer's Authority to Suspend Work**

The Engineer shall have the authority to suspend the Work, in whole or in part, for such a period as he deems necessary, due to conditions that he considers unfavourable for the execution of the Work or due to the failure of the Contractor to comply with any provision of the Contract.

Upon receipt of the Engineer's notice to suspend the Work, the Contractor shall immediately suspend those operations as are specified. No such suspension shall vitiate or void the Contract or any part thereof or any security or obligation for the performance thereof or relieve the Contractor of any other responsibility under the terms and conditions of the Contract, including the preservation and care of the work site and Material.

During a period of suspension the Contractor shall not remove without the consent of the Engineer any part of the Material or equipment previously provided for the Contract.

Except in situations of imminent danger, the Contractor shall not suspend the Work without the consent of the Engineer.

##### 51.2.21.2 **No Compensation**

Subject to Section 51.2.21.3, Compensation for Standby, the Contractor shall not have any claim for compensation or damages against the Department for any suspension, stoppage, hindrance or delay from any cause.

No compensation will be paid for a suspension, stoppage, hindrance or delay of the Work due to the fault of the Contractor including, without limiting the generality of the foregoing, delays by strikes by the Contractor's or subcontractors' employees.

##### 51.2.21.3 **Compensation For Standby**

When the Work or any part of it is suspended by order of the Engineer for a reason that is not related to the Contractor's performance of the Work, the Department may consider a claim for payment of standby costs which may be incurred by the Contractor. When such costs are claimed, they shall be legitimate, reasonable and supported by proper documentation as required by the Engineer, and submitted in accordance with Section 51.2.60, Claims and Dispute Resolution.

The Department will not pay for standby costs related to any of the following:

- Weather or other natural conditions;
- Failure by the Contractor to carry out orders given by the Engineer;
- Any failure by the Contractor to comply with a requirement or provision of the Contract;

- Any failure by the Contractor to provide for the safety of the public or his or the Department's work force;
- Any failure by the Contractor to protect the property of the Department or others;
- Any delay incurred in remedying defects or failures in the Work;
- Any change in the quantity of any item of Work from the estimated quantity shown in the Work Order;
- Any equipment or work force which was not actually present and actively working on the Work immediately prior to the suspension of the Work;
- Any haul trucks or their drivers used on the Work;
- Any suspension of the Work that is less than 4 hours in duration; and
- Testing of Material or Work for compliance with Specifications and Plans.

When a claim for standby is considered by the Engineer, direct costs which, in the opinion of the Engineer, could not have been avoided by the judicious handling of forces, equipment or plant will be paid to the Contractor in an amount that the Engineer deems fair and reasonable. No item of cost, other than idle time rate of equipment and necessary payments for idle time of workers, will be considered.

Compensation for standby time of workers and equipment will be determined by the Engineer in accordance with the following criteria:

- (a) the time paid will not exceed 8 hours in any day;
- (b) overhead and profit will be excluded; and
- (c) The idle time equipment rates will be 50% of the hourly rates identified in the Alberta Roadbuilders and Heavy Construction Association Equipment Rental Rates and Membership Roster current at the time of the temporary suspension or at a rate agreed to by the Engineer and the Contractor.

Upon termination of the suspension by the Engineer, the Contractor shall resume operations no later than the commencement of the next working day.

#### 51.2.22 HINDRANCES AND DELAYS

##### 51.2.22.1 **Utilities**

The Contractor shall advise the Engineer in an acceptable format of the requirement for relocation of utilities. Upon receipt of notification from the Contractor, the Engineer will arrange with the utility owners or operators to adjust their utility installations as necessary, within or adjacent to the Work. All such adjustments will be made by the owners or operators, except as otherwise provided for in the Special Provisions or as specifically noted on the Plans. The adjustment will be made at no cost to the Contractor.

No additional compensation will be paid by the Department for any delay, inconvenience or damage sustained by the Contractor which is caused by the existence of or adjustment to the utilities. However, if the Work cannot be done in the ordered completion time, an extension will be granted.

The Contractor shall consider in his scheduling those items of the Work essential to the adjustment of the utilities, and the Work shall be scheduled and performed at the time required to accommodate these adjustments. No additional compensation beyond that specified on the Work Order will be made by the Engineer.

#### 51.2.22.2 **Work by Others**

When separate Department contracts or agreements are in effect on or near the Work, the Contractor shall conduct the Work so as to minimize interference with progress or completion of work being performed by other contractors. The Contractor shall cooperate with others working on or near the Work and, in the case of dispute as to procedure or scheduling of the Work, the Engineer will make the final decision, and it shall be binding on the Contractor.

The Contractor shall have no claim against the Department for any inconvenience, delay or loss arising from the presence and operations of others on or near the Work.

#### 51.2.23 DEFAULT

##### 51.2.23.1 **Causes And Notice**

A Contractor who:

- (a) fails to begin the Work under the Contract within the time specified;
- (b) discontinues the prosecution of the Work;
- (c) fails to furnish security;
- (d) fails to provide the written undertaking required by Section 51.2.23.5, Emergency Winter Default Procedure;
- (e) fails to furnish insurance coverage; or
- (f) loses accreditation in a recognized safety program;

shall be deemed to be in default of the Contract.

In addition, the Department will use a progressive demerit point system to determine when the Contractor is deemed to be in default of the Contract and a financial penalty system as outlined in Section 51.2.23.5, Penalties for Unsatisfactory Performance.

##### 51.2.23.2 **Demerits**

The Contractor shall be deemed to be in default and the Contract will be terminated when:

- there are a total of 5 or more demerit points in force at any point in time in any one Contract Maintenance Area; or
- for a Contract covering two Contract Maintenance Areas, there are a total of 7 or more demerit points in force at any point in time; or
- for a Contract covering three Contract Maintenance Areas, there are a total of 9 or more demerit points in force at any point in time; or



- for a Contract covering four Contract Maintenance Areas, there are a total of 11 or more demerit points in force at any point in time; or
- for a Contract covering five Contract Maintenance Areas, there are a total of 13 or more demerit points in force at any point in time; or
- for a Contract covering six Contract Maintenance Areas, there are a total of 15 or more demerit points in force at any point in time; or
- for a Contract covering seven Contract Maintenance Areas, there are a total of 17 or more demerit points in force at any point in time.
- for a Contract covering eight Contract Maintenance Areas, there are a total of 19 or more demerit points in force at any point in time.
- for a Contract covering nine Contract Maintenance Areas, there are a total of 21 or more demerit points in force at any point in time.

An assessed demerit point will be removed by the Engineer and shall no longer be in force when one calendar year has passed from the date of issuance of the demerit point.

The Engineer will assess demerit points against a Contractor for the following causes and in the following amounts:

- (a) 1 demerit point to a Contractor who:
- (i) Fails to prosecute the Work with sufficient skilled workers and equipment or with sufficient Material to ensure the prompt completion of the Work within the maximum allotted time on more than 20% of the total value of the Work that was scheduled for completion over a 3 month period or other time period, as specified by the Engineer. In calculation of the value of the work, indirect costs will be excluded.

In addition to the above, if a Contractor fails to complete work that exceeds 15%, but is less than or equal to 20%, of the total value of the Work scheduled for completion over a 3 month period or other time period, as specified by the Engineer, then the Department's representative may apply a financial penalty of \$5,000 without issuance of a demerit point. No prior written notice of a non-demeritable financial penalty is required prior to the penalty being applied. Non-demeritable financial penalties may only be applied a maximum of twice per fiscal year.

Non-demeritable financial penalties will not be applied when lateness of the total value of work exceeds 20%. In such cases, only the financial penalties specified in Section 51.2.23.4, Penalties for Unsatisfactory Performance, will apply.

The Contractor may appeal application of a non-demeritable financial penalty to the Regional Director.

- (ii) fails to promptly pay his creditors for labour, services, equipment, supplies and materials used or reasonably required for use in the Work within 90 days of receipt of a valid invoice;
- (iii) fails to repair any defect or failure discovered in the Work within the warranty period or within the period agreed upon between the Engineer and the Contractor; or
- (iv) in the opinion of the Engineer, performs the Work unsuitably.

- (b) 2 demerit points to a Contractor who:
- (i) fails to have available, a staff complement of trained and experienced and properly licensed snowplow operators, as set out by the Contractor in his Proposal, unless otherwise approved by the Engineer;
  - (ii) fails to maintain the minimum number of snow removal equipment on standby as set out by the Contractor in his Proposal, unless otherwise approved by the Engineer;
  - (iii) provides deliberate false documentation respecting any component of the Work;
  - (iv) neglects or refuses to remove Material or to redo Work rejected as defective and unsuitable; or
  - (v) compromises the safety of the travelling public.
  - (vi) fails to comply with the Lease Agreement or Environmental Management Plan covering the use of maintenance facilities or sites.

#### 51.2.23.3 **Failure to Remedy**

Should the Contractor fail to proceed diligently to remedy or rectify any of the causes giving rise to a demerit point within 6 days of receipt of the notice from the Engineer, the Contractor may be deemed to be in default and the Engineer may, without violating the Contract, take the prosecution of the Work out of the hands of the Contractor and:

- (a) appropriate or use any Material at the work site to complete the Work;
- (b) enter into an agreement with another person for the completion of the Work; or
- (c) use any other methods that in the Engineer's opinion may be required to complete the Work.

The Engineer may then deduct the costs incurred from any money due or to become due to the Contractor.

#### 51.2.23.4 **Demerit Point Assessment and Appeal Process**

The assessing of Demerit Points will occur on the recommendation of the Operations Manager, and will be assigned by the Regional Director.

Prior to assessing demerit points, the Regional Director will meet with the Contractor and will review and discuss any objections, or mitigating circumstances presented by the Contractor.

Should the Contractor wish to appeal the ruling of the Regional Director regarding the assessment of demerit point(s), he may appeal to the Executive Director, Program Management Branch. Such appeal shall fully explain all grounds for the appeal and shall be submitted in writing within seven days of receipt of the Regional Director's assessment of points. The Executive Director will render a decision within seven days of receiving the appeal.

Should the Executive Director reject the appeal, the Contractor may have the issue ultimately resolved through the dispute resolution process contained in the document entitled "Dispute Resolution Process for Alberta Construction Contracts." In order to invoke such process, the Contractor must, within 14 days of receiving the Executive Director's decision regarding the appeal, issue the Executive Director with a written Notice of Dispute.

#### 51.2.23.5 Penalties for Unsatisfactory Performance

A penalty of \$5,000 will be assessed against the Contractor upon the issuance of one demerit point providing the Contractor has no other demerit points in force. If the Contractor has any demerit points in force, the penalty for each additional point will be \$10,000. If the Contractor receives two demerit points at the same time and no prior demerit points are in force, then the financial penalty assessed will be \$10,000 (\$5,000 for each point). If however, the Contractor is assessed two demerit points and there is already one demerit point in force, then the financial penalty assessed would be \$20,000 (\$10,000 for each point). The penalty will be deducted from funds due to the Contractor in the monthly estimate following the issuance of the demerit point.

#### 51.2.23.6 Emergency Winter Default Procedure

The safe accommodation of the travelling public during adverse winter conditions is viewed by the Department as a critical component of the Contract. To ensure the continuity of operations in the event of Contractor default in winter, the following procedure will be followed:

- (a) Prior to signing the Contract, the Contractor will identify to the Department all parties who have an interest in the snow removal equipment, shops and material storage sites and update this list as required.
- (b) The Contractor shall provide to the Department a written undertaking from each party or subcontractor or subcontractor's interested party which will allow the Department to continue winter operations, permitting the Department to access shops and material storage sites to remove salt and sand material and to use the Contractor's equipment and labour, for whatever duration is reasonably necessary to allow appropriate alternative arrangements to be made. Such written undertaking shall be renewed on an annual basis.
- (c) During this period, the Department will make payment at the appropriate unit prices to the party or parties or subcontractor(s) having an interest in the equipment, salt and sand material removed, and will negotiate with the parties, payment for shops rental and material storage sites rental for the facilities used.
- (d) The Contractor shall not remove any snow removal equipment during winter without permission of the Engineer.
- (e) The Contractor shall furnish the Department with a list of addresses and phone numbers for all of his employees and subcontractors involved in winter maintenance activities.

#### 51.2.24 ANNULMENT WITHOUT FAULT OF CONTRACTOR

The Minister reserves the right to annul the Contract at any time upon giving at least 15 days notice in writing, to the Contractor, in which event the Contractor shall cease Work and shall be entitled to payment under the terms and conditions of the Contract for the Work done by him up to the time of the annulment.

The Minister will reimburse the Contractor for those costs, verified by the Minister, that are directly chargeable to that portion of the Contract not performed by reason of annulment and which he deems justifiable.

#### 51.2.25 ASSIGNMENT AND SUBCONTRACTING

The Contractor shall not assign the Contract or any payment or other benefit under the Contract without written permission of the Engineer.

The Contractor shall not subcontract the whole of the Work to be performed by the Contractor under the Contract. The Contractor shall not subcontract any part of the Work associated with Snow Removal and Ice Control where the value of that Work exceeds \$25,000, nor shall the Contractor subcontract any part of the Work, other than Snow Removal and Ice Control, where the value of that Work exceeds \$100,000, without prior written consent of the Engineer, unless such subcontract is identified in the Proposal and accepted by the Department. Both competency and the proposed subcontractor's existing work load with the Department will be considered when evaluating requests for subcontractor approval.

The Contractor shall not subcontract any part of the Work to a contractor of a separate Department Highway Maintenance Contract, where the value of that Work exceeds 10% of the annual Contract value of this Contract.

The Engineer reserves the right to reject any subcontract he considers unsatisfactory. No subcontract, even though duly consented to, shall exonerate the Contractor from liability under the Contract for the due performance of the Work. The Contractor shall be responsible for all acts, defaults, neglects and delays of any subcontractor and his agents and employees to the same extent as if no subcontract or assignment had been entered into.

The Contractor shall ensure to his satisfaction that any subcontractors/owner-operators are able to comply with all health, safety, and environmental requirements before commencing Work. Once the subcontractor or owner operator have commenced work, the Contractor shall periodically monitor their activities to ensure compliance.

#### 51.2.26 CHANGES TO WORK FORCE AND/OR EQUIPMENT

Prior to making any major changes in equipment or personnel, the Contractor shall demonstrate to the Engineer that the requirements of the Contract, the requirements of the Contractor's Proposal, and the requirements of any subsequent authorized changes can be met.

#### 51.2.27 CHANGES IN THE WORK

As new technology is developed or as circumstances and conditions change, the Engineer, without invalidating the Contract, may make changes to the Contract and may alter, add to, or deduct from the Work. The Contractor shall proceed with the Work as changed, and the Work shall be executed under the provisions of the Contract. No change shall be undertaken by the Contractor, without written order of the Engineer, except in an emergency endangering life or property, and no claims for additional compensation shall be valid unless the change was so ordered.

If, in the opinion of the Engineer, such changes affect the cost of conducting operations, the value of the change to the Contract and the method of determining such value shall be decided by the Engineer. The Engineer will use one or more of the following methods in deciding such value:

- (a) existing unit prices or combinations of existing unit prices;
- (b) unit prices submitted by the Contractor and accepted by the Engineer;
- (c) by lump sum submitted by the Contractor and accepted by the Engineer; or
- (d) on an Extra Work basis as specified in Section 51.2.28, Extra Work.

If the Contractor and the Engineer cannot agree on the unit prices to be used or on the lump sum, the Engineer will decide and certify the value of the change in the Contract amount that is, in his opinion, fair and reasonable to both parties. If the Contractor disagrees with the Engineer's decision, the Contractor

may submit a Notice of Claim to the Engineer in accordance with the process specified in Section 51.2.60, Claims and Dispute Resolution.

#### 51.2.28 EXTRA WORK

##### 51.2.28.1 **General**

Extra Work shall include Work not specified in the Contract or of a class not included in the Contract.

When the Engineer issues a Work Order that includes Extra Work, the Engineer will either negotiate with the Contractor to establish a new unit price for the Extra Work, a lump sum price for the Extra Work or pre-authorize all labour, equipment and material, necessary to perform the Work, and it will be paid for as detailed in the remainder of Section 51.2.28, Extra Work.

##### 51.2.28.2 **Labour**

For all labour directly involved in the Extra Work, the Contractor will be paid the actual cost of labour including the wages at the scale being paid on the Contract Work and payments made to or on behalf of the workers for holiday pay, Workers' Compensation Board assessment, insurance and pension payments, plus 20% of the total of the Extra Work labour account.

##### 51.2.28.3 **Equipment**

For each piece of equipment used directly in the Extra Work, including trucks but excluding small tools, the Contractor shall receive payment:

- (a) at the rates shown in the Equipment Rental Rates Guide for Equipment to which no allowance will be added; or
- (b) for third-party equipment rental accounts, at the rates invoiced by the third party, provided these rates were approved by the Engineer prior to the commencement of the Extra Work, to which will be added 15%; or
- (c) at the agreed price or prices as stated in the Engineer's Extra Work Order, to which no allowance will be added.

##### 51.2.28.4 **Equipment Rental Rates Guide for Equipment**

The Equipment Rental Rates Guide for Equipment is the version of the Alberta Roadbuilders and Heavy Construction Association Equipment Rental Rates and Membership Roster current at the time of issuing the Extra Work.

##### 51.2.28.5 **Purchased Material**

For all Material purchased by the Contractor solely to perform or incorporate into the Extra Work, as required by the Engineer, the Contractor will receive payment:

- (a) at the agreed price as stated in the Engineer's Extra Work Order, to which no allowance will be added; or
- (b) if there is no agreed price, at the amount shown on the supplier's invoices, to which will be added 15%.

Material purchased for the Extra Work, that is not used in the performance of the Extra Work as a result of the direction of the Engineer, shall at the Engineer's discretion:

- (a) become the property of the Department and shall be delivered by the Contractor to a location designated by the Engineer, or
- (b) be retained by the Contractor, and an agreed value shall be deducted from the Extra Work account.

#### 51.2.28.6 **Supervision**

For supervision required directly on the Extra Work operation, the Contractor will be paid the actual cost of superintendent's or foreman's wages at the scale being paid on the Contract Work, including statutory payments made to them or on their behalf for holiday pay, Worker's Compensation Board, insurance and pension payments, plus 20% of the total of the account.

If the supervisory personnel are also engaged in Work other than the Extra Work, only that portion attributable to the Extra Work will be paid for by the Department.

#### 51.2.28.7 **Transportation of Workers and Equipment**

Vehicles used in the transportation of workers and small tools required exclusively for the Extra Work shall be considered as equipment and will be paid for as provided in Section 51.2.28.3, Equipment, for the period for which the vehicles are required.

The transportation of heavy construction equipment hauled or otherwise moved to the project exclusively for the Extra Work, or when necessary from separate points on the job to the site of the Extra Work and upon the completion of the Extra Work from the project, will be paid for at the applicable rates in accordance with Section 51.2.28.3, Equipment, provided that the means of transporting the equipment and haul distances have been previously approved by the Engineer.

The Contractor, prior to mobilizing equipment for Extra Work, shall confirm the source of the equipment and the haul distance to the Work site with the Engineer. The Contractor will also identify the site for demobilizing the equipment and the haul distance to that site.

Payment for demobilizing equipment from the site of the Extra Work to another Department job site, will be made provided that transporting the equipment to the new site is not paid for under another item.

#### 51.2.28.8 **Payment for Extra Work**

The compensation provided in this section shall be payment in full for all charges, including overhead and profit, and for the use of small tools for which no rental is allowed.

The Contractor shall present his claim for payment for Extra Work as part of the regular payment process specified in Section 51.2.15, supported by proper vouchers giving details as to dates, quantities, rates, third-party invoices and any other supporting documentation that the Engineer requires.

#### 51.2.29 **ENGINEER SOLE JUDGE OF WORK**

The Engineer shall be the sole judge of the Work and Material in respect of both quality and quantity, and his decision on all questions in dispute in this regard, or as to the meaning or intention of the Contract and as to the meaning or interpretation of the Plans and Specifications shall be final. No Work under the Contract shall be deemed to have been performed nor Material or thing provided so as to entitle the Contractor to payment, unless and until the Engineer is satisfied, as evidenced by his estimate in writing, which estimate shall be a condition precedent to the right of the Contractor to be paid.

### 51.2.30 AUTHORITY OF THE ENGINEER

#### 51.2.30.1 **Orders of the Engineer**

All orders, directions and instructions given at any time by the Engineer with respect to the Work or the conduct thereof shall be promptly and efficiently performed and complied with by the Contractor to the satisfaction of the Engineer.

#### 51.2.30.2 **Work Methods and Equipment**

Equipment and methods used shall be adequate to perform the Work. The Engineer reserves the right to order the discontinuation of use of any equipment or method which, in his opinion, fails or will fail to produce satisfactory results.

#### 51.2.30.3 **Defective Work**

When the Engineer identifies any defective Work, whether the result of poor workmanship, damage through the Contractor's carelessness or use of defective Material supplied by the Contractor, the Contractor shall, at his expense, promptly remove, replace or otherwise remedy the defective Work to conform to the Specifications in a manner acceptable to the Engineer.

Should the Contractor fail to comply promptly with any order made under this Section, the Engineer may cause the defective Work or material to be remedied, removed or replaced and deduct the costs incurred from any money due or to become due to the Contractor.

#### 51.2.30.4 **Unauthorized Work**

Any work done without required notification, or Material supplied by the Contractor which is beyond the lines, grades, or descriptions shown on the Plans and Specifications or established by the Engineer, will be considered as unauthorized and may not be paid for.

Upon order of the Engineer, unauthorized Work or Material shall be remedied, removed or replaced by the Contractor at his expense in a manner acceptable to the Engineer.

Should the Contractor fail to comply promptly with any order made under this Section, the Engineer may cause unauthorized Work or Material to be remedied, removed or replaced, and deduct the costs incurred from any money due or to become due to the Contractor.

### 51.2.31 AUTHORITY OF THE OPERATIONS MANAGER

The Operations Manager is placed on the Work by the Engineer to manage the Contract on his behalf and keep the Engineer informed on the progress of the Work and the manner in which it is being performed. The Operations Manager has the additional responsibility of ensuring that Department budgetary and conditional targets for the Contract are achieved. To meet these requirements, the Operations Manager is authorized to:

- (a) Identify and authorize the Work to be performed;
- (b) Reject defective Material and Work and prohibit any Work method or procedure that will result in a finished product that fails or will fail to meet the standards required by the Specifications or Plans;
- (c) Give final acceptance of any portion of the Work;

- (d) Inspect all Work done and Material furnished, such inspection to extend to any part of the Work and to the preparation, fabrication or manufacture of the Material to be used;
- (e) Approve new unit prices for undefined Work included in a specific Work Order;
- (f) Approve any Extra Work required;
- (g) Approve the rate for equipment not listed in the Alberta Roadbuilders and Heavy Construction Association Equipment Rental Rates and Membership Roster when used on a Work Order for Extra Work;
- (h) Suspend the Work;
- (i) Adjust Work Order completion dates;
- (j) Recommend to the Engineer the assessment of demerit points;
- (k) Approve subcontractors;
- (l) Represent the Engineer at the Operational Planning Meetings and participate in the Executive Management Meetings.
- (m) Judge public safety factors/conditions; and
- (n) Suspend Work due to work site hazards.

The Operations Manager is not authorized to extend or make changes to the Contract, or alter or waive provisions of or issue instructions contrary to the Specifications or Plans.

The Operations Manager will not act as foreman or superintendent for the Contractor.

The Operations Manager will exercise such additional authority as may from time to time be delegated by the Engineer.

#### 51.2.32 AUTHORITY OF THE OPERATIONS ENGINEER

The Operations Engineer and/or Operations Services Coordinator assists the Operations Manager in the day-to-day administration and delivery of the highway maintenance program within a district or region.

#### 51.2.33 AUTHORITY OF THE CONTRACT INSPECTOR

The Contract Inspector is placed on the Work by the Engineer to assist the Operations Manager in identifying the Work to be performed and to inspect and accept the Work.

#### 51.2.34 AUTHORITY OF A FIELD SERVICES TECHNOLOGIST

The Field Services Technologist is placed on the Work by the Engineer to assist the Operations Manager and the Contract Inspector in identifying the Work to be performed and to inspect and accept the Work.

#### 51.2.35 AUTHORITY OF THE REGIONAL SAFETY OFFICER

In cases of recognized imminent danger, the Department's Regional Safety Officer has the authority to suspend the Work.



51.2.36 CONTRACTOR'S PROJECT SUPERVISOR

The Contractor shall maintain a competent project supervisor on the Work who shall be present on the site of the Work during its progress. The project supervisor shall be considered the representative of the Contractor, shall be fully authorized to act for him in all aspects of the Work, including the work of all subcontractors, and shall receive such communications as may be given by the Engineer.

51.2.37 STAKES, MARKS AND ENGINEERING TESTS

Stakes or marks may be set by the Engineer to define the location, alignment, elevation, and grade required for the Work. The Contractor shall give the Engineer ample notice of the time and place where the stakes or marks will be needed. The Contractor shall protect, and shall not remove or destroy or permit to be removed or destroyed, the stakes or marks placed on or about the Work by the Engineer.

The Contractor shall satisfy himself before commencing the Work as to the correctness and meaning of all stakes and marks.

When the Engineer provides to the Contractor summaries of engineering test results taken on or about the Work by the Engineer, the Contractor shall satisfy himself as to the meaning and correctness of the engineering test results.

The Contractor shall not take advantage of any apparent error or omission in the Plans, Specifications, stakes, marks, engineering tests, or other measurements done or provided by the Engineer, but shall immediately bring such apparent error or omission to the attention of the Engineer. The Engineer will make corrections and interpretations as may be necessary for the fulfilment of the Plans and Specifications.

The Engineer will consider claims for payment of the Contractor's documented extra costs which have resulted from incorrect stakes, marks or engineering tests that neither the Contractor nor the Engineer has recognized in time to prevent the occurrence of such extra costs or that have been drawn to the attention of the Engineer by the Contractor but have not been corrected in a reasonable period of time. Such claims shall be made in accordance with the specified procedures for compensation adjustment.

51.2.38 PARTNERING

It is the Department's intention to encourage the foundation of a cohesive relationship between the Contractor and its principal subcontractors and suppliers. The working relationship will be structured to draw on the strengths of each organization to identify and achieve common goals. The objectives are effective and efficient Contract performance and completion of the Work within budget, within the specified time, and in accordance with the Plans and Specifications.

The working relationship, to be called "Partnering", will be bilateral in make-up, and participation will be totally voluntary. The Department considers Partnering a critical and key process to the success of the maintenance outsourcing initiative. Any cost associated with implementing this process will be agreed to by both parties and will be shared equally. Each party will be responsible for its own staff's wages during partnering workshop sessions.

Once the Contractor and the Department mutually commit to Partnering it is expected that the management and supervisory forces of the Contractor and the Department will fully support Partnering and the agreed Partnering principles and processes.

The establishment of a Partnering agreement for the Contract will not change the legal relationship of the parties to the Contract nor relieve either party from any of the terms of the Contract.

A strong working relationship helps the work to be completed safely, on time, on budget, and within the plans and specifications laid out in the contracts to which all participants have agreed. To that end, the Department has documented its standard practices and processes for administration of highway and bridge maintenance contracts in a Contract Administration Manual, which is available to the Contractors for their reference.

This manual sets out a philosophy and standard approach to contract highway and bridge maintenance administration for Alberta. The manual is not a contractual document and will be updated as required.

#### 51.2.39 MOBILE COMMUNICATIONS SYSTEM

The Contractor is responsible for providing, at his cost, the mobile communication devices and required hardware so that each snow plow truck, grader, foreman's vehicle, superintendent's vehicle and other vehicles and personnel required to perform Highway Maintenance Work is equipped with a mobile communication unit. These devices must be capable of truck to truck, truck to shop and truck to telephone-network communication.

All personnel reporting winter road conditions must have a procedure to update the AMA website.

The Contractor is responsible for all costs including installation, maintenance and removal of communication devices, early termination charges, local airtime costs, long distance charges and for other services such as wide area, roaming, wireless web and value added services.

#### 51.2.40 COMMUNICATIONS

##### 51.2.40.1 **General**

While communication of any notice, order, direction, consent, offer, or otherwise may be given in any reasonable manner, important communications from the Contractor to the appropriate representative of the Department, or the Department's representative to the Contractor, shall be in writing.

Any important communication required to be given by the Department's representative to the Contractor may be personally delivered to the Contractor or his project supervisor or delivered or mailed to the office of either, and shall be deemed to have been received on the day it was delivered or on the fifth day after it was mailed.

Any important communication required to be given by the Contractor to the Department's appropriate representative may be personally delivered or delivered or mailed to his office and shall be deemed to have been received on the day it was delivered or on the fifth day after it was mailed.

Communication required to be in writing may also be given by facsimile, or any other method agreed to by the parties, and shall be deemed to have been received no later than 8:00 a.m. of the first business day after it was transmitted.

##### 51.2.40.2 **Work Order Distribution**

The Engineer will normally issue Work Orders to the Contractor in an appropriate electronic mode, by facsimile or hand delivery.

##### 51.2.40.3 **Verbal Communications**

Any verbal direction given to the Contractor by the Engineer will normally be confirmed later in writing.

#### 51.2.40.4 **Communication with Outside Agencies and the Public**

##### 51.2.40.4.1 General

The Contractor shall maintain at all times a toll free telephone number that is well publicized throughout the Contract area.

The Contractor, upon receipt of an enquiry related to highway maintenance from other parties, shall note the name, address and telephone number of any such party. The Contractor shall, upon request provide such party with the Operations Manager's address and telephone number. Copies of this information will be provided to the Engineer upon request.

Furthermore, the Contractors are encouraged to work with the Department on public awareness campaigns regarding highway maintenance activities.

##### 51.2.40.4.2 Emergency Communications

The Contractor shall provide for direct communication for emergency notification on a 24 hour a day, seven day a week basis.

Prior to starting Work on the Contract, the Contractor shall provide the Engineer and the local emergency authorities with telephone numbers of his authorized personnel and the order in which they are to be contacted. The Contractor shall provide the Engineer and local emergency authorities with an updated list as needed to ensure accuracy.

The Engineer will provide the Contractor with a list of Department representatives and the order in which they are to be contacted. The Engineer will update the list as needed to ensure accuracy.

Both the Contractor and the Department will when necessary, provide each other with temporary contact lists to be used during holiday periods. The list will be provided in advance of the holiday period and will specify the time period for which it is to be used.

When contacted by emergency services such as the RCMP, fire departments, or representatives of Disaster Services, concerning an emergency situation, the Contractor shall cooperate with the request and respond in accordance with the procedure indicated in Section 51.2.14.3, Emergency Situations.

##### 51.2.40.4.3 Vehicle Markings

The Contractor shall ensure that the Contractor's name and contact telephone number (in the form of a toll free number) are prominently displayed on the sides of all of his vehicles involved in the Work.

#### 51.2.41 MEETINGS

##### 51.2.41.1 **Operational Planning Meetings**

The Contractor and the Engineer will meet twice monthly, unless mutually agreed otherwise, to discuss and review the following types of issues:

- (a) The Contractor's Work Plan as specified in 51.2.14.6;
- (b) Work completed in the previous 2 weeks;
- (c) Work the Contractor has planned for the next 2 weeks;

- (d) Work the Department plans to issue within the next 2 weeks;
- (e) Status of Work in progress; and
- (f) Any project, technical, administration or communication problems.

These meetings will be at a location and time agreed to by the Contractor and the Engineer. Meetings may be cancelled by mutual agreement.

There will be no direct payment to the Contractor for participating in the meetings or for providing facilities for the meeting if required.

Minutes of meetings will be taken alternately by each party, with copies distributed to both parties within 5 working days of the meeting.

#### 51.2.41.2 **Executive Management Meetings**

Senior representatives from both the Department and the Contractor will participate in a management meeting a minimum of twice a year, spring and fall or at such other times as agreed to by both parties. At these meetings, the parties may discuss the following types of issues:

- (a) Scope and magnitude of anticipated Work for the next 6 month period;
- (b) The Department's budget and any budgetary constraints on the Work;
- (c) Updates and changes in the Contractor's business plan and financial plan; and
- (d) The Contract management process, with discussions on project performance over the preceding 6 months.

There will be no payment to the Contractor for participating in the meetings and for providing facilities for the meeting if required.

#### 51.2.42 COMPLIANCE WITH LAWS AND REGULATIONS

The Contractor shall, in the performance of the Work, comply with the requirements of the laws in force in the Province of Alberta.

In performing the Work, the Contractor shall comply with all applicable statutes, regulations, by-laws, orders and directives of the respective governmental authorities having jurisdiction, shall obtain any permits, licenses, approvals or consents necessary for the Work or the Materials, and shall pay any tax, levy, fee or other like charge required to be paid in order for the Contractor to perform the Work or for the Minister to use the Materials.

#### 51.2.43 PAYMENT BY WEIGHT

##### 51.2.43.1 **Supply of Platform Weigh Scales**

When payment by weight is specified, the Engineer will determine whether or not a platform weigh scale is required.

If the Engineer requires the use of a platform weigh scale and a suitable platform or silo weigh scale exists within reasonable proximity of the worksite or haul route, such a weigh scale would normally be used. In these situations the Department will compensate the Contractor for any additional costs incurred in obtaining access to and using the weigh scale. Such costs will be established to the mutual agreement of the Engineer and the Contractor, prior to commencement of the Work.

If the Engineer requires the use of a platform weigh scale and a suitable platform or silo weigh scale does not exist in the area, the Engineer will require the Contractor to provide a platform weigh scale. In these situations, the Department will compensate the Contractor for the supply and use of a platform weigh scale (including a scale house and scaleperson) as Extra Work, in accordance with Section 51.2.28, Extra Work.

If the Engineer does not require the use of a platform weigh scale, the Contractor shall have the option of having measurements made in cubic metres and converted to tonnes using the applicable specified conversion factor or, providing and using any type of scale which is capable of accurately weighing the material. In these situations, if a scale is used, the costs associated with the provision and use of the scale will be considered incidental to the Work and will not be paid for separately.

#### 51.2.43.2 **Operating Standards for Platform Weigh Scales**

All platform weigh scales used in the Work must be certified by Measurement Canada of the Federal Department of Consumer and Corporate Affairs. The most recent certificate must be displayed on the weigh scale at all times. In the event a certified weigh scale is modified in any way, the Contractor shall ensure the scale is re-certified prior to being used.

Prior to use for work identified in a Work Order and in each instance that a certified weigh scale is moved and set up, the Engineer may require the Contractor to "test" the weigh scale using the procedures established by Measurement Canada. The purpose of this "test" is to ensure the weigh scale conforms with the current standards required by Measurement Canada. The Engineer reserves the right to be in attendance during the entire testing process. When such testing has been ordered the Contractor shall provide the Engineer with reasonable notice of the date and time of the "test".

The cost of testing the weigh scale will be paid as Extra Work in accordance with Section 51.2.28, Extra Work.

#### 51.2.43.3 **Verification of the Accuracy of a Weigh Scale**

Regardless of the type of weigh scale used the Engineer may, when he deems it necessary, require the Contractor to verify the accuracy of the weigh scale at any time. The Contractor shall provide all equipment, facilities and labour required to verify the accuracy of the weigh scale and shall cooperate fully in the process. Any costs incurred by the Contractor in the verification process will be considered incidental to the Work and will not be paid for separately.

#### 51.2.44 **PAYMENT BY VOLUME**

When payment by volume is specified, quantities will be based on truck box measurement unless otherwise specified.

When the Work involves the use of existing stockpiles and the quantity of Material is known through prior measurement or calculation, the Engineer may direct that the previous quantity be used for calculation of payments.

51.2.45 RECORDS OPEN FOR INSPECTION

The Contractor's payrolls, time records, invoices, statements, and any other financial documents, data or records which may, in the Engineer's opinion, have any relation to the Contract shall at all times be open for inspection and copying by the Engineer. The Contractor shall assist the Engineer in every possible way in this inspection.

The Department will work cooperatively with the contractor to ensure that only the appropriate people within the Department have access to these records and that the confidentiality of these records is maintained.

51.2.46 DATA FOR INFRASTRUCTURE MANAGEMENT SYSTEM

When Work is performed on any highway appurtenance, the Contractor shall furnish appurtenance inventory data in a format compatible with the Department's Infrastructure Management System. Generally, the data shall be submitted on forms provided by the Department and shall be provided on but not be limited to, the following appurtenances: signs, lighting facilities, culverts, railway crossings, line painting, pavement messages, guardrail, traffic signals, crash barriers, rumble strips and other miscellaneous items. Where the required information cannot be derived from the Work Order, the Contractor will be required to provide details of the types of Work performed and Materials installed. The Contractor shall provide the required data on the Work performed at no cost to the Department. When the Engineer directs the Contractor to collect data on work performed by others, payment for this additional data collection will be made in accordance with Section 51.2.28, Extra Work.

51.2.47 OWNERSHIP OF DATA

Data and information provided by the Department to the Contractor during the performance of the Work shall remain the property of the Department.

Copyright and ownership of all data collected and provided, and in all drawings prepared by or on behalf of the Contractor during the performance of the Work shall become the sole property of the Department.

51.2.48 CONFIDENTIALITY

The Contractor shall treat data and information concerning the Minister or third parties, or the business activities of them, as confidential and not disclose, copy, use, or permit the use of it at any time or in any way, other than for the purpose of performing this Contract. The Contractor shall not communicate any matters concerning the Work to any member of the public or any news medium, whether the press or radio or television, without the prior written consent of the Engineer.

The Contractor shall limit the disclosure of confidential information to those persons to whom such disclosure is strictly necessary for the performance of the Contract and shall ensure that those persons are bound by obligations of confidentiality equal to those contained in this section.

The Contractor shall not use the name of the Department in whole or in part, in publicity releases, advertising or promotion of the Contractor's business without the Department's written consent.

Likewise the Department shall not disclose any confidential information concerning the Contract to any 3<sup>rd</sup> parties such as municipalities, suppliers, subcontractors, other contractors or consultants without the written consent of the Contractor.

51.2.49 FREEDOM OF INFORMATION

Any information collected or generated by the Contractor in the course of the performance of the Contract, is the sole property of the public body and is subject to the Freedom of Information and Protection of Privacy Act as well as all other regulatory requirements governing the management of personal information.

The Department when dealing with requests received under the Freedom of Information Protection of Privacy Act, will contact the Contractor prior to releasing any information to a third party under this legislation.

51.2.50 MAINTENANCE FACILITIES

The Department may specify that certain Government-owned sites be used for the Work. Such sites would typically be used for storing small quantities of "salt treated" sand.

Other existing Government-owned buildings and land located within the Contract area boundaries may be made available to the Contractor for lease on a site-by-site basis in accordance with the Special Provisions.

The Contractor is ultimately responsible to provide all maintenance facilities and stockpile sites necessary to meet the requirements of the Contract.

In all maintenance facilities or sites including those provided by the Contractor, the Contractor shall conduct all activities in compliance with the Environmental Protection Act.

51.2.51 EXISTING SAND AND SALT STOCKPILES FROM A PREVIOUS DEPARTMENT CONTRACT

At the commencement of the Contract, surplus sand and salt material from a previous Department Highway Maintenance Contract may exist at stockpile sites to which the Department has access. The Engineer may direct the Contractor to use such material in winter maintenance activities by depleting the material from the existing site(s) or hauling and stockpiling the material (for future use) at site(s) being used by the Contractor for this Contract.

In the event the Engineer directs the Contractor to haul surplus sand and salt from an existing site to the Contractors' site(s), payment for loading, hauling and stockpiling such material will be made as Extra Work.

51.2.52 PRECAUTIONS AS TO FIRE

The Contractor shall, at his own expense, take special precautions to prevent or extinguish uncontrolled fire occurring at or near the work site which is a result of the Contractor's performance of the Work.

51.2.53 OCCUPATIONAL HEALTH AND SAFETY ACT

51.2.53.1 **Occupational Health and Safety Act**

The Contractor shall familiarize himself, his staff and his subcontractors with the terms of the Occupational Health and Safety Act and Regulations to ensure complete understanding respecting the responsibilities given and compliance required. The Contractor acknowledges that he is and assumes all of the responsibilities and duties of the Prime Contractor as defined by the Occupational Health and Safety Act, and that he shall, as a condition of the Contract, comply with the Occupational Health and Safety Act and the regulations thereunder.

In the event that the work sites of 2 or more Prime Contractors coincide, it shall be the responsibility of the Prime Contractor of this Contract to liaise with all other prime Contractors and jointly develop a health and safety system or process for the affected work site. If 2 or more Prime Contractors of the Department cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected work site shall cease and the matter shall be referred to the Engineer or his representative. Upon review, the Alberta Transportation representative will decide which Prime Contractor shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all Prime Contractors.

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act and Regulations, establish and maintain a health and safety system or process to ensure compliance with the Act by his employees, agents and subcontractors/owner operators.

#### 51.2.53.2 **Work Site Hazards**

The Contractor has the responsibility to identify work site hazards and develop operational occupational safety policies, procedures and plans specific to the Work to ensure the safety of every person at the construction site and of the public travelling through the site. When requested by the Engineer, the Contractor shall provide copies of these safety policies, procedures and plans prior to the commencement of the Work, along with verification that they have been submitted to Alberta Human Resources and Employment, Workplace, Health and Safety.

If Alberta Human Resources and Employment, Workplace, Health and Safety conducts a work site inspection that results in orders being issued to the Contractor, the Contractor shall immediately supply copies of these orders to the Contract Inspector.

The Contract Inspector may suspend Work in accordance with Section 51.2.21.1, Engineer's Authority to Suspend Work, in cases of recognized imminent danger or when the Contractor fails to comply with safety orders issued or to rectify previously identified work site hazards. The Contract Inspector's interpretation of a work site hazard will be considered final in all cases.

#### 51.2.53.3 **Accident Investigations**

In the event of an injury or accident as defined by Occupational Health and Safety regulations, involving employees of the Contractor or his subcontractors working on this Contract, the Contractor shall immediately notify the Engineer and conduct an accident investigation in accordance with Section 18 of the Occupational Health and Safety Act. In addition, the Contractor shall supply a copy of this investigation report to the Engineer within 72 hours of the occurrence.

#### 51.2.53.4 **Safety Meetings**

Upon Contract award, a pre-commencement meeting will be conducted by the Department. The Contractor shall ensure his project supervisor, the designated safety representative and a representative from each subcontractor named in the Proposal are in attendance.

While the Work is in progress, the Contractor's project supervisor shall conduct safety meetings prior to the commencement of Work on each major Work phase or monthly, whichever occurs first. The Engineer or his designate shall be invited to attend.

#### 51.2.53.5 **Scaffolding, Falsework and Temporary Protective Structures**

All scaffolding, falsework and temporary protective structures shall be designed for the loads they are required to carry. They shall be engineered and designed for safety in all respects, and shall meet the



requirements of the Occupational Health and Safety Act. Drawings shall be stamped by a Professional Engineer, registered or eligible for registration in Alberta. The Contractor shall verify all components are as shown on the drawings before use. A copy of these drawings must be retained on site at all times the system is in use.

#### 51.2.54 POLLUTION CONTROL

The Contractor shall conduct his operation in accordance with all current environmental legislation; federal, provincial and local bylaws and other legislation that may affect the conduct of operations.

The Contractor shall become familiar with the applicable legislation and regulations.

The Contractor shall obtain all necessary approvals and permits that are not otherwise the responsibility of the Department and provide copies to the Engineer.

The Contractor shall remove and dispose of any inert solid waste resulting from the production of asphalt concrete pavement, concrete or soil cement to the satisfaction of the Engineer.

The Contractor shall clean up any waste arising from his Work which may cause pollution. Should the Contractor fail to do so, the Engineer may, without notice, arrange the clean-up and restoration of the site at the expense of the Contractor.

#### 51.2.55 CLEAN WORK SITE

During the course of the Work, the Contractor shall keep the work site in a neat and tidy condition satisfactory to the Engineer. The Contractor shall upon the completion of the Work, remove all temporary structures and clear away all rubbish, surplus, and waste material remaining at or near the work site and leave the area in a neat and tidy condition satisfactory to the Engineer. If these requirements are not met, the Engineer may give written notice to the Contractor requiring him to remedy the situation. If the Contractor fails to remedy the situation within 14 days of receipt of the notice, the Engineer may cause the situation to be remedied and may deduct the cost thereof from any money owing to the Contractor.

#### 51.2.56 DEMURRAGE AND DAMAGES

The Contractor shall be responsible for the prompt loading, unloading and delivery of all Materials for the Work and for any demurrage and storage charges.

#### 51.2.57 SAFEGUARDING UTILITY INSTALLATIONS

##### 51.2.57.1 **Contractor's Responsibility**

The Contractor is responsible for safeguarding all existing and relocated utility installations during the progress of the Work and is liable for any damage to the utility resulting from performance of the Work.

##### 51.2.57.2 **Liaison and Location**

The Contractor shall ensure that all utility installations are located and clearly marked on the ground before commencing operations. The Contractor is responsible for contacting all affected utility owners or operators to determine the existence and location of all utility installations, maintaining liaison with the utility owners or operators concerning the adjustment of all utilities and coordinating his operations in compliance with Section 51.2.22, Hindrances and Delays.

### 51.2.57.3 **Precautionary Measures**

The Contractor shall take all precautionary measures as may be necessary when working over, under, or adjacent to utility installations, whether above or below ground, and shall control his equipment and method of operation to prevent damage to any utility and its appurtenances.

Under no circumstances shall the Contractor carry out any operations over or adjacent to any utility until the required adjustments and protection as required for the proposed Work have been completed. Additionally, the Contractor shall provide at least 48 hours notice to the utility owner or operator in advance of commencing operations in that area. After completion of the utility Work by the utility owner or operator, the Contractor shall continue to work in close liaison with the utility owner or operator and, if the utility owner or operator so requires, ensure that a representative of the affected utility owner or operator is present at all times during active equipment operations at that location. The Contractor shall ensure that no equipment crosses or operates over or under any utility installation at locations other than where required protection has specifically been provided, and shall work in close cooperation with the utility owner or operator in the execution of the Work. When the Work is in the vicinity of any unprotected utility installation, the Contractor shall exercise extreme caution to ensure that the utility installation is not damaged by the equipment or applied loads. When haul roads or equipment crossings are required, it shall be the Contractor's responsibility to determine, provide and install any protective works necessary and to observe any other necessary precautions.

### 51.2.58 DISPOSAL SITES

The Contractor shall be responsible for identifying and using proper disposal sites, including obtaining all necessary approvals from the appropriate jurisdiction or authority. In addition, when requested by the Engineer, the Contractor will provide information on the disposal site such as location and haul distance to the site.

### 51.2.59 TIME OF COMMENCEMENT

The Contractor shall commence the Work at 12:01 a.m. Mountain Standard Time on the commencement date specified in the Special Provisions

### 51.2.60 CLAIMS AND DISPUTE RESOLUTION

#### 51.2.60.1 **Claims Resolution**

The resolution of claims arising between parties to the Contract, is subject to the following structured process:

##### 51.2.60.1.1 Claims

If a situation or occurrence arises between the Department and the Contractor, in connection with or arising out of the Contract or the execution of the Work, which results in a difference in opinion between the parties as to payment or compensation required under the Contract or the time required to complete the Work that can not be resolved through the Partnering process, such situation or occurrence shall be considered a Claim.

##### 51.2.60.1.2 Resolution of Claims

Where the Department or the Contractor considers that a Claim has arisen under the Contract, the Department or Contractor shall issue a Notice of Claim to the other party.

A Notice of Claim shall be in writing and shall state the details of the claim. A Notice of Claim issued by the Contractor to the Department pursuant to the Contract shall be served to the Contract Inspector as defined in Section 51.2.33, Authority of the Contract Inspector.

A Notice of Claim shall be served as soon as possible after the occurrence of the circumstance giving rise to the Claim and not later than seven (7) days after the occurrence of the circumstance, or the claimant becoming aware of the circumstance. Failure to serve a Notice of Claim within this prescribed time period will prejudice the claimant's right to proceed with the Claim, unless the claimant can demonstrate that such delayed Notice did not prejudice the ability of the other party to take action to minimize any additional costs resulting from the Claim.

The parties shall make bona fide efforts to resolve a claim and the Work shall proceed without delay during the claims resolution process. Attempts to resolve claims shall sequentially follow the Department's administrative review structure as follows:

1. Operations Manager
2. Regional Director
3. Executive Director, Program Management Branch

The Department or the Contractor may not unilaterally proceed to litigation without agreement of the other party.

In the event the claim is not resolved to the satisfaction of both parties through this process and the claimant wishes to pursue the matter further, it is incumbent upon the claimant to issue a Notice of Dispute in accordance with Appendix A, Mandatory Dispute Resolution Process of the document entitled "Dispute Resolution Process for Government of Alberta Construction Contracts."

#### 51.2.60.2 **Dispute Resolution Process**

Claims which escalate into disputes, and appeals to the Engineer's decision regarding the assessment of demerit points, shall be resolved through the processes identified in the document entitled "Dispute Resolution Process for Government of Alberta Construction Contracts", Appendices A, B, C, D, & E. In the event of a conflict between the aforementioned Appendices and other provisions of the Contract, the Appendices shall govern.

All references to Owner in the "Dispute Resolution Process for Government of Alberta Construction Contracts" shall mean the Department.

Any Notice of Dispute issued by the Contractor to the Department pursuant to this Contract shall be served to:

Executive Director, Program Management Branch  
2nd Floor, Twin Atria Building  
4999-98 Avenue, Edmonton, AB, T6B 2X3

#### 51.2.61 **DAMAGE TO WORK**

The Work shall be at the risk of the Contractor and he shall bear all loss or damage arising from any cause, excepting acts of the Queen's enemies, which may occur to the Work or as a result of the Work until the Work is accepted by the Engineer. If any such loss or damage occurs before this acceptance, the Contractor shall at his own expense immediately repair, restore and re-execute the lost or damaged Work so that the Work, or the portions thereof, shall be completed within the specified time.

## 51.2.62 EQUIPMENT AND MATERIALS

### 51.2.62.1 **Equipment**

The Contractor shall supply all equipment necessary to complete the Work. When specific types of equipment are required, such equipment will be specified in the Technical Specifications.

All equipment supplied must meet the required mechanical safety standards for the applicable acts and regulations.

### 51.2.62.2 **Materials**

The Material requirements specified in the respective Technical Specifications refer to the most commonly used products. In addition to the materials specified in the Technical Specifications, a list of recognized products/materials and specifications will be available through the Department's website.

In the event that the Contractor and the Engineer agree to the use of a product/material which was not specified at the time of Contract award, the Contractor and Engineer may negotiate a new unit price for the Work.

## 51.2.63 EXTENSION OF CONTRACT

The Minister and the Contractor may mutually agree to extend the expiry date of the Contract.

## 51.2.64 PRICE ADJUSTMENT DUE TO INFLATION

### 51.2.64.1 **General**

A price adjustment factor is included in the Contract to provide the Contractor and the Department with a fair method of accounting for the impact of inflationary and deflationary influences upon the Contract over its term. These influences will be accounted for through the development of a single adjustment factor, which will be based on changes in specific indices published by Statistics Canada and manpower rates published by 3 separate agencies.

### 51.2.64.2 **Price Adjustment Factor Calculation**

The price adjustment factor will consider a blend of inflation in a) manpower, b) consumer goods, c) construction costs and d) diesel fuel prices. It will result in an adjustment factor which will be weighted on the ratio of 35% manpower, 45% consumer goods, 15% for construction costs and 5% diesel fuel for a total of 100%.

The indices will be calculated based on the following:

- (a) for Manpower, a combination of the following 3 publications will be used: i) the Alberta Union of Provincial Employees (AUPE) Local 12 published rates for Technologies 4 at the top level, ii) the Construction Labour Relations published rates for the Teamsters negotiated rates for 8 – 12 yd3 Tandem Axle Truck Operators and Certified General Labourer rates, and iii) Alberta Roadbuilders and Heavy Construction Association (ARHCA) published rates for the International Union of Operating Engineers (Group 1), Local 955.
- (b) for Consumer Goods, Statistics Canada Table 326-0020, Consumer Price Index, Alberta, all items.
- (c) for Construction Costs, Statistics Canada Table 327-0043, Non-Residential Construction Price Index, the numerical average of the Edmonton and Calgary values.

- (d) for Diesel Fuel, Statistics Canada Table 329-0047, Industry Price Indexes for non-metallic mineral products and petroleum and coal products, by regions, Diesel Fuel Prairies.

The base index level for all 4 categories will be established using values as of December 31, 2000. The annual December 31 values, when published, will be reviewed by the Engineer. The annual values will be compared to those of the base year, and an index will be developed by using 1.000 for the base year. The annual calculated index values for each year will be compared to the base year, and the difference from the previous year will be used in developing the current year's price adjustment factor.

**EXAMPLE:**

The following table provides a sample of how the price adjustment factors will be developed. This sample uses actual numbers from the above noted publications for calculation of the 2004/05 price adjustment factor, and uses 2000 as the base year.

**2004/05 PRICE ADJUSTMENT FACTOR**  
**2000 BASE YEAR**

**(a) MANPOWER**

	2000	2001	2002	2003
(i) AUPE Local 12 annual salary (top of a Technologies 4) NOTE: does not include benefits	\$46,757	\$50,148	\$52,152	\$53,977
Construction Labour Relations (Certified General Labour Hourly Wage)	\$28.33	\$30.10	\$31.61	\$32.72
Construction Labour Relations (Teamsters, 8 - 12 yd <sup>3</sup> Tandem Axle Truck Operators Hourly Wage)	\$32.91	\$35.54	\$37.32	\$38.63
*(ii) Construction Labour Relations (Combined Average)	\$30.62	\$32.82	\$34.47	\$35.67
(iii) Alberta Roadbuilders & Heavy Construction Assoc. (Group 1 Hourly Rate)	\$25.16	\$26.16	\$27.01	\$28.64
<b>Calculated Indexes</b>				
(i) Alberta Union of Provincial Employees, Local 12	1.0000	1.0725	1.1154	1.1544
(ii) Construction Labour Relations (Combined Average)	1.0000	1.0718	1.1256	1.1650
(iii) Alberta Roadbuilders & Heavy Construction Assoc.	1.0000	1.0397	1.0735	1.1383
<b>MANPOWER INDEX</b>	<b>1.0000</b>	<b>1.0614</b>	<b>1.1048</b>	<b>1.1526</b>

\*Note: both CLR hourly rates were increased by 3.5% (same as AUPE), as negotiations are ongoing and resolution is not expected until May. CLR advises that the increase will be in the 2.5% - 4% range.

**(b) CONSUMER GOODS**

<b>Statistics Canada All Items</b>	2000	2001	2002	2003
Alberta	117.4	120.1	124.2	129.7
<b>CONSUMER GOODS INDEX</b>	<b>1.0000</b>	<b>1.0230</b>	<b>1.0579</b>	<b>1.1045</b>

**(c) CONSTRUCTION COSTS**

<b>Statistics Canada Non-Residential</b>	2000	2001	2002	2003
Edmonton	108.6	112.1	114.4	117.5
Calgary	109.7	113.3	115.8	119.4
<b>Calculated Indexes</b>				
Edmonton	1.0000	1.0320	1.0534	1.0817
Calgary	1.0000	1.0331	1.0561	1.0887
<b>CONSTRUCTION COSTS INDEX</b>	<b>1.0000</b>	<b>1.0325</b>	<b>1.0547</b>	<b>1.0852</b>

**(d) DIESEL FUEL PRICE**

<b>Statistics Canada (DIESEL FUEL)</b>	2000	2001	2002	2003
Prairies	132.1	129.9	118.5	131.3
<b>DIESEL FUEL PRICE INDEX</b>	<b>1.0000</b>	<b>0.9828</b>	<b>0.8966</b>	<b>0.9934</b>

**(e) NET INDEX CHANGE**

<i>Weighting Factors</i>	2000	2001	2002	2003
MANPOWER (35%)	0.3500	0.3715	0.3867	0.4034
CONSUMER GOODS (45%)	0.4500	0.4603	0.4761	0.4970
CONSTRUCTION COSTS (15%)	0.1500	0.1549	0.1582	0.1628
DIESEL FUEL PRICE (5%)	0.0500	0.0491	0.0448	0.0497
<b>NET INDEX CHANGE</b>	<b>1.0000</b>	<b>1.03585</b>	<b>1.06579</b>	<b>1.11287</b>

**ESCALATION ADJUSTMENT FACTOR: 1.0358 1.0289 1.0442**  
**EFFECTIVE ON: (April 02) (April 03) (April 04)**

51.2.64.3 **Application of Price Adjustment Factor**

Initial application of the price adjustment factor will be specified in the Special Provisions. For each subsequent Departmental fiscal year (that is, April 1 to March 31) until contract termination, a price adjustment factor will be calculated and applied to all of the Contract unit prices.

51.2.65 ALLOWABLE NUMBER OF CONTRACT MAINTENANCE AREAS

In accordance with Section 2.3, Contracts for Individual or Multiple Contract Maintenance Areas as contained in the "Highway Maintenance Request for Proposal", it is the intention of the Department to limit the number of CMA's administered by any one Contractor to twelve. To this end, the Department will monitor the ownership and corporate structure of all maintenance Contractors throughout the term of the Contract and will take appropriate steps to ensure that the "twelve CMA" limitation is adhered to.

## **51.3 TRAFFIC ACCOMMODATION AND TEMPORARY SIGNING**

### **51.3.1 GENERAL**

The Work consists of accommodating traffic through work areas and the installation, maintenance and removal of temporary signing which is specifically related to construction/maintenance operations and which is generally removed when the Work is completed or the situation returns to normal. The Contractor shall implement traffic accommodation controls on all aspects of the Work to ensure the safety of the workers and the travelling public and all signing shall be provided in accordance with the latest edition of the Department's "Traffic Accommodation in Work Zones" manual.

Some maintenance work has a minimal impact on traffic flow and therefore may not require full signing and/or traffic accommodation under all circumstances. Examples which may fall into this category are:

- removal of isolated debris (tire treads and other small objects);
- removal of small animals from the roadway;
- spontaneous filling of sporadic potholes (involving at least two workers);
- normal snow plowing and ice control operations
- washing delineators or signs; and
- other work which is entirely off the roadway surface

The Engineer will identify Work in this category. However, agreement that complete signing is not necessary, does not release the Contractor from the obligation to keep the work site safe for both workers and the travelling public.

### **51.3.2 HOURS OF WORK**

All Work within the right-of-way shall be performed during daylight hours only, unless it is provided otherwise in the Technical Specifications or unless adequate lighting exists which provides visibility of at least 700 metres and prior approval of the Engineer is obtained. Emergency work may also be carried out during hours of darkness with the approval of the Engineer.

No Work shall be performed within the right-of-way when the visibility is less than 700 metres, unless otherwise specified in the Technical Specifications or approved by the Engineer.

### **51.3.3 THIRD PARTY ACCIDENT REPORTING**

The Contractor shall immediately notify the Engineer of any accidents involving his or his sub-contractors vehicles or equipment or that occur in a Work Zone, and which involve a fatality, serious personal injury, or 3rd party property damage in excess of \$1,000 or as specified in the Motor Vehicle Administration Act, or any act or regulation that replaces the Motor Vehicle Administration Act Provisions. The Contractor shall investigate the accident (including those of his sub-contractors) and complete a detailed accident report in a form satisfactory to the Engineer within 72 hours of knowledge of the accident. (Report to include photos, details of site conditions, records of signs, etc.).

### **51.3.4 MATERIALS**

The Contractor shall supply signs, sign posts, weighted stands and any other materials necessary to complete the Work.

Temporary signs shall conform to required standards, in shape, colour and size. The orange portion of all signs, barricades and other traffic control devices shall be fully reflectorized using High Brightness, Retroreflective, Non-Metallized, Prismatic Sheeting Material which incorporates durable, transparent,



fluorescent pigment and meets the requirements as shown in the Department's Products List. All other colours of sheeting material shall be Type III, High Intensity meeting the requirements of ASTM D4956. Standards for colours, shapes and sizes are referenced in the Standards for Signs.

#### 51.3.5 CRASH ATTENUATOR

When crash attenuators are specified for in the specifications or special provisions they shall meet the National Cooperative Highway Research Program, Report 350 Test Criteria, Test Level 3 for 100 km/hour work zones. The weight of the crash attenuator vehicle including ballast, flashing arrow board and truck mounted crash attenuator shall be 6 300 to 12 000 kg.

#### 51.3.6 TRAFFIC ACCOMMODATION STRATEGY

When required by the Engineer and prior to commencement of the Work, the Contractor shall prepare Traffic Accommodation Strategies detailing the measures he proposes for the accommodation traffic throughout work zones for the various highway maintenance activities. Each Traffic Accommodation Strategy shall consist of drawings detailing the configuration of temporary signs and other traffic control devices in the work zone. Strategies shall also include written confirmation of the methods or procedures being used by the Contractor to address specific safety related issues or situations within each work zone.

The Contractor shall submit his proposed Traffic Accommodation Strategy to the Engineer prior to commencement of the Work. The Engineer will review the Traffic Accommodation Strategy and communicate any concerns to the Contractor. Any issues or concerns regarding the Contractor's proposed Traffic Accommodation Strategy shall be addressed to the mutual satisfaction of the Contractor and the Engineer prior to the commencement of the Work.

The Engineer may allow the use of a single Traffic Accommodation Strategy for multiple occurrences of similar highway maintenance activities. Typically, this may be appropriate in situations where there are no significant differences in the site specific issues to be addressed for each occurrence of the activity.

The various maintenance activities for which Traffic Accommodation Strategies will be required and the timing of the submission of the Strategies by the Contractor will be determined by the Engineer at the pre-commencement meeting.

#### 51.3.7 PROCEDURES

##### 51.3.7.1 **General**

Work shall not commence until all necessary traffic control devices and/or detours are in place.

The Contractor shall make suitable provisions, including the use of detours, to accommodate all vehicular and pedestrian traffic safely with a minimum of inconvenience through or around the Work. The Contractor shall provide, install, maintain and protect traffic control devices such as signs, barriers, fences, lights, and such other methods, including the use of flagpersons, as may be required. Traffic control devices shall be moved and kept as close to the work area as practical, as the Work proceeds.

The Contractor shall remove or cover all traffic control devices when they are not essential for the safe accommodation of traffic.

The Contractor shall coordinate traffic accommodation measures with those of other forces at or adjacent to the Work, as required, to accommodate traffic safely and conveniently. This shall not relieve the Contractor of the responsibility for the safe accommodation of traffic over the whole of the Work.

#### 51.3.7.2 **Signing**

When signs require frequent moves, portable type signs, mounted on weighted stands, may be used. Portable signs shall 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. The stands shall be securely weighted and erected against being blown over by prevailing winds or gusts from passing vehicles.

Non-portable signs shall be conspicuously posted, and erected at right angles to the roadways, with the bottom of the sign at a height of 1.5 m above the roadway surface, and not less than 2 m nor more than 6.0 m from the nearest traffic lane.

During periods of darkness, signs indicating hazardous conditions and signs requiring increased attention shall be marked with flashers.

Temporary signs shall be erected and maintained in accordance with the latest edition of the Department's Traffic Accommodation in Work Zones manual.

The Department may issue updates for specific types of Work not shown in the Traffic Accommodation in Work Zones manual. In the interim, the Contractor shall propose a typical signing drawing to be reviewed by the Engineer and this configuration will be followed for the duration of the Work.

Poorly maintained, defaced, damaged or dirty construction signs shall be replaced, repaired or cleaned without delay. Special care shall be taken to ensure that construction materials and dust are not allowed to obscure the face of a sign.

Objects within or immediately adjacent to the roadway which constitute a hazard to traffic shall be identified with appropriate safety hazard markers.

"STOP" signs shall be installed on all subsidiary roads (local, district, municipal, service or approach) intersecting a Provincial Highway Detour Route in accordance with the Traffic Accommodation in Work Zones manual.

When a reduction in speed is required, signs shall be posted as indicated in the Traffic Accommodation in Work Zones manual. Signs shall indicate limits as ordered by the Engineer.

All temporary signs shall be removed as soon as possible after the project is completed.

#### 51.3.7.3 **Flagpersons**

When maintenance operations or work zone conditions cause interruption, delay or hazard to the travelling public, flagpersons shall be continuously maintained for the direction and control of traffic. The Contractor shall ensure that flagpersons are instructed in and use proper traffic control procedures appropriate for the prevailing conditions. Flagpersons shall have proof of certification from a recognised training program on traffic control procedures through construction zones. Traffic control programs administered by the Alberta Construction Safety Association will be considered acceptable. The Engineer reserves the right to accept or reject certification from any other institute.

Flagpersons shall be dressed in safety apparel (coveralls) which meets the Class 3 Level 2 requirements of CSA Z96-02, High Visibility Safety Apparel. Each pair of coveralls shall have a permanent label affixed certifying compliance with Class 3 Level 2 of CSA Z96-02.

The colour of the coveralls shall be fluorescent yellow-green with silver retroreflective striping. The retroreflective striping shall be a minimum of 50mm wide and shall be sewn onto a 100mm wide

fluorescent red-orange background material. Flagperson safety apparel must be kept clean and in good condition. Faded, torn and/or dirty coveralls, or coveralls without a CSA certification label, will not be acceptable and shall be replaced by the Contractor at the Department's discretion.

Prior to commencement of the Work, the Contractor shall identify and assess existing and potential hazards at the project site. Where there is a foreseeable risk of injury to a worker's head, flagperson's shall wear fluorescent orange protective hardhats meeting the requirements of CSA Standard Z94.1-92.

Where no foreseeable risk of head injury exists, flagpersons will be permitted to wear any type of fluorescent orange headgear.

During hours of darkness, flagpersons shall be additionally equipped with a red signal hand-light of sufficient brightness to be clearly visible to approaching traffic and flagging stations shall be illuminated by overhead lighting.

#### 51.3.7.4 **Detours**

Subject to the approval of the Engineer, detours may be used to carry traffic around the Work.

When traffic is diverted entirely off the right-of-way, the Contractor shall establish or construct and maintain a detour that shall be complete with signs at every intersection in accordance with the Traffic Accommodation in Work Zones manual.

When the Contractor is directed by the Department to use a local road as a detour, the Contractor shall obtain approval from the local road authority to use the detour, and maintain and restore the detour to a standard at least equivalent to its original condition. This will include regravelling if required. The Contractor will be compensated for this Work at the appropriate bid prices. The Engineer will be the final authority on the condition of the detour.

When the Contractor chooses to use a local road as a detour, the Contractor shall obtain approval from the local road authority to use the detour and maintain and restore the detour to the condition required by the local road authority. The local road authority will be the final authority on the condition of the detour.

#### 51.3.7.5 **Removal and Salvage of Existing Signs and Guideposts**

All existing signs and guideposts, which are to be removed in the prosecution of the Work shall be carefully salvaged by the Contractor and maintained in a condition suitable for reinstallation. Critical signs necessary for the protection of traffic, such as railroad crossing signs or Stop or Yield signs shall be maintained in place.

#### 51.3.8 **MODIFICATIONS TO TEMPORARY SIGNING**

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

#### 51.3.9 **DAILY RECORDING OF TEMPORARY SIGNING**

When required by the Engineer, the Contractor shall record the location of all temporary signs and other traffic control devices. When such recording is required, it shall be performed each day and as the work

zone changes. The Contractor shall record this information on a form suitable to the Engineer and shall submit the information to the Engineer upon request.

#### 51.3.10 COMPLIANCE

In cases where the Contractor is not in compliance with the specifications and, in the opinion of the Engineer there is imminent danger to the travelling public, the Engineer has the authority to order the immediate suspension of Work. Such orders must be made in writing.

In other cases where the Contractor is not in compliance with the specifications but, in the opinion of the Engineer the infraction is not causing imminent danger to the travelling public, the Engineer will use the following escalating process to address the situation:

Issue verbal instructions requiring the Contractor to correct the infraction

Issue a written warning instructing the Contractor to correct the infraction

Issue a written order instructing the Contractor to suspend Work until the infraction is corrected to the satisfaction of the Engineer.

#### 51.3.11 MEASUREMENT AND PAYMENT

Provisions for traffic accommodation and the supply, installation, maintenance and removal of any temporary signing will be considered incidental to the Work and will not be paid for separately unless otherwise specified in the Technical Specifications.

When the Engineer directs that a detour road be constructed, the costs of constructing and maintaining the temporary detour and for any required gravelling or dust control of the detour surface will be paid for at the applicable unit prices bid for the type of Work performed. If there are no applicable unit prices for the Work being performed, payment will be made as Extra Work in accordance with Specification 51.2, General Specifications (for Maintenance Work). When the Contractor uses a detour which has not been requested by the Engineer, these costs will be the responsibility of the Contractor and no payment will be made.

## WINTER MAINTENANCE

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## 52.1 SNOW REMOVAL AND ICE CONTROL (TRUCK)

### 52.1.1 GENERAL

The Work consists of loading trucks, snowplowing and the application of sand, salt or a sand and salt mixture to roadway surfaces.

### 52.1.2 MATERIALS

The sand/salt mixture shall be stored inside an enclosed structure. If it is to be stored with the salt the structure shall be large enough to store the materials separately and permit the trucks to be loaded inside the structure. Untreated sand may be stored in a separate (uncovered) stockpile. The conditions for the supply of these materials are detailed elsewhere in the Contract Specifications or in the Special Provisions.

### 52.1.3 EQUIPMENT

#### 52.1.3.1 **General**

The Contractor shall supply and maintain an equipment fleet meeting the requirements specified herein and in the Special Provisions. The number of trucks and their storage locations will be determined by the Contractor using the method described in the Special Provisions.

#### 52.1.3.2 **Loader**

The bucket size of the loader shall be a minimum of 1.3 cubic metres.

#### 52.1.3.3 **Truck**

Tandem axle trucks equipped with a wing shall have a minimum 325 horsepower engine. All other tandem axle trucks shall have a minimum 270 horsepower engine. Single axle trucks shall have a minimum 210 horsepower engine. Gross engine horsepower will be the rating as shown in the manufacturers' specifications. All plow trucks shall have a properly operating engine hour meter.

Each truck shall have a valid Alberta Vehicle registration or equivalent permit and a current Commercial Vehicle Inspection Certificate Decal. The decal shall be displayed on the vehicle at all times. The Contractor shall maintain each truck to the minimum standard established by the commercial vehicle inspection. All snow plow trucks shall be properly designed and engineered to safely operate under the expected load capacity and extreme working conditions. If, in the opinion of the Engineer, the truck is not in a satisfactory mechanical or safe condition, then it shall be removed from the work site until the necessary repairs have been made.

At the beginning of the first winter season, the average age of the snow plow truck fleet shall be no more than nine years. The age of each vehicle will be based on the designated model year as assigned by the manufacturer. For the remainder of the Contract there will be no restriction on the average age of the fleet.

Each truck engaged in the Work shall be assigned a unique number that is prominently displayed on the truck, for the duration of the Contract. The doors of each truck shall prominently display the Contractor's company name or logo and phone number.

All snow plow trucks shall be properly designed and engineered to safely operate under the combined load capacity of all attachments (sanding unit, front and underbody plows, wing, dual wings and pre-



wetting system). Snowplow trucks with dual wings will not be allowed to operate with both wings down at any time.

When snowplowing on recently applied seal coats or asphalt stabilized base course surfaces, as determined by the Engineer, trucks shall be equipped with power floats, castor wheels or rubber blades to reduce damage done to these surfaces. The use of other "protective equipment" will be subject to the approval of the Engineer. Any damage to these surfaces resulting from the snowplowing operation shall be repaired by the Contractor at his expense.

#### 52.1.3.3.1 Standard Lighting and Warning Devices

##### 52.1.3.3.1.1 General

Standard lighting and warning devices for all types of snowplow trucks shall be in accordance with the following sections of this specification. Variances to this specification will only be allowed upon written approval by the Department. This applies to new lighting technology, changes in light types, light locations and lighting configurations.

All snowplow trucks in the Contractor's fleet shall be equipped with two strips of specialized retro-reflective tape as specified in section 52.1.3.3.1.10, and a rear wind deflector as specified in section 52.1.3.3.1.11.

Notwithstanding this specification, snowplow truck lighting shall conform to all applicable regulations and SAE standards.

##### 52.1.3.3.1.2 Rear Lighting

Rear lighting configurations shall conform to Drawing HMS 52.1E and be acceptable to the Department. They shall include the following:

- LED stop, tail and turn lights,
- LED rear identification lights,
- Raised LED stop, tail, turn and backup lights box mounted,
- Amber Dual Rotating Lamp Beacon or LED Mini Light Bar
- LED amber-red flashing warning lights above-box mounted.

Adjustment of rear lighting shall be done using Drawing HMS 52.1F as a guideline.

##### 52.1.3.3.1.3 Front Lighting

Front lighting configurations shall conform to Drawing HMS 52.1D and shall include an amber dual rotating lamp beacon or LED mini light bar. The front mounted beacon or light bar shall be unobstructed and clearly visibly.

##### 52.1.3.3.1.4 LED Stop, Tail and Turn Lights

Two (2) red "Stop-Turn-Tail" lights and one (1) clear "Backup" light shall be installed on the bumper of the snowplow truck, on both the left and right sides. These shall be LED lights with each having a minimum surface area of 78.5 cm<sup>2</sup>, and they shall be mounted horizontally across the rear bumper of the snowplow truck.

#### 52.1.3.3.1.5 LED Rear Identification Lights

Rear vehicle lighting shall be centered on the back of the box of the snowplow truck, slightly below the box wind deflector. These shall be red LED lights, sized no larger than the “Stop-Turn-Tail” lights, spaced between 150mm – 300mm apart.

#### 52.1.3.3.1.6 Raised LED Stop, Tail and Turn Lights - Box Mounted

Two (2) red LED “Stop-Turn-Tail” lights shall be mounted on both upper corners of the snowplow truck box. These lights shall each have a minimum surface area of 78.5 cm<sup>2</sup> and shall be mounted in a horizontal configuration as shown on drawing HMS 52.1E. The lights shall be mounted at the highest location possible on the rear of the box, without being obstructed by the wind deflector or other vehicle appurtenances. These red LED lamps will operate as Stop-Turn-Tail lights in conjunction with the Stop-Turn-Tail lights on the bumper on the snowplow truck.

A set of clear LED “Backup” lights shall be mounted on the rear of the snowplow truck box, slightly inside (towards the center) of the “Stop-Turn-Tail” lights. These lights shall each have a minimum surface area of 78.5 cm<sup>2</sup> and shall be mounted at the highest location possible on the rear of the box, without being obstructed by the wind deflector or other vehicle appurtenances. These clear LED lamps will operate as “Backup” lights in conjunction with the “Back-up” lights on the bumper on the snowplow truck.

#### 52.1.3.3.1.7 Amber Dual Rotating Lamp Beacons or LED Mini Light Bars

Two separate dual rotating beacons or LED mini light bars (or a combination of both) meeting the following requirements and acceptable to the Department shall be mounted on the snowplow truck (front and rear).

Dual rotating amber lamp beacons shall have minimum dimensions of 115mm (4.5”) H x 380mm (15”) L x 160mm (6.3”) W, that meet or exceed SAE J845 Class 1, “360° Warning Devices for Authorized Emergency, Maintenance and Service Vehicles”. The beacons shall provide between 250 to 500 flashes per minute, with minimum 50 Watt halogen bulbs. The bulbs shall be setup such that both bulbs do no flash in the same direction at the same time. Strobe beacons shall not be used.

Amber LED mini light bars shall have minimum dimensions of 2" tall x 20" long x 10" wide, and must be capable of a minimum of 12 different flash patterns.

The rear warning beacon or light bar shall be mounted in the centre of the vehicle, at the top of the snowplow box, a minimum of 0.75 metres from the top of the box.

#### 52.1.3.3.1.8 LED Amber-Red Flashing Warning Lights – Above-Box Mounted

Two (2) red LED lights, each with a minimum surface area of 131.25 cm<sup>2</sup>, shall be mounted vertically on raised extension brackets that are mounted along the outside rear edges of the snowplow box. The lights shall be mounted so that the bottom of the LED lamp is approximately 3.10 metres above the ground.

Two (2) amber LED lamps, each with a minimum surface area of 131.25 cm<sup>2</sup>, shall be mounted horizontally, approximately 0.50 metres from the outside edges of the snowplow truck, such that the top edge of the light is at the same height as the vertically mounted red LED light.

The amber LED light shall flash on and off at a flash rate of 3 – 5 flashes per second. The red LED light shall remain on at all times in a “steady-burn” mode. The amber lights shall be focused using Drawing HMS 52.1F as a guideline.

#### 52.1.3.3.1.9 Light Operations – Monitoring and Maintenance

To prevent snow accumulation, all LED lights, except for the rectangular LED amber-red flashing warning lights, shall be mounted in locations with wind deflectors above them.

Before plowing operations begin, front and rear lighting shall be examined to ensure all lights are operational. If any lights are not operational, they shall be repaired prior to the commencement of any plowing operations. Additionally, if any diodes are burnt-out, or have a reduced luminance, they shall also be replaced prior to commencement of plowing operations.

Rear lighting shall be periodically checked during plowing operations to ensure that they are functioning properly and are not obstructed by accumulations of snow or slush.

#### 52.1.3.3.1.10 Reflective Tape

Two strips of specialized retro-reflective tape shall be located horizontally across the width of the truck, one at the midpoint of the truck, approximately 2 metres from the ground. The second strip may be located at the Contractor's discretion, but must conform to Transport Canada regulations. The specialized retro-reflective tape shall provide reflectivity during day and night use, and shall be at least 50mm wide and contain alternating blocks of red and white colors.

#### 52.1.3.3.1.11 Rear Wind Deflector

A rear wind deflector shall be installed above the box of the snowplow truck in such a manner as to force the flow of air down the rear of the snowplow truck. The wind deflector shall extend across the full width of the truck box and be located such that the bottom of the wind deflector is located no more than 300 mm from the top of the Raised LED Stop, Tail and Turn Lights.

### 52.1.3.4 Sanding Unit

The sanding unit shall be either a frame mounted or slide-in-box type with a minimum capacity of 8.5 cubic metres for tandem axle units and 5.0 cubic metres for single axle units.

Sanding units shall be equipped with height adjustable material deflectors and spinners capable of both clockwise and counter clockwise movements and in-cab controls for regulating the discharge of a sand, salt or a sand and salt mixture, as required by the prevailing road conditions. The Contractor shall ensure the trucks are licensed to carry the minimum capacity.

### 52.1.3.5 Snowplow

All trucks shall be equipped with a snowplow. The snowplow blade shall be front mounted one-way for right side plowing only or two-way for both left and right side plowing, as indicated in the Special Provisions. The snowplow shall be equipped with a minimum 3.66 metre wide blade, in-cab controls for lifting and adjusting the plow blade and 330 mm x 410 mm red flags mounted on the top outside edges of the blade.

Underbody plows shall be provided when specified for in the Special Provisions. Details of underbody plows will be identified in the Special Provisions.

### 52.1.3.6 Snowplow Wing

The number of trucks to be equipped with snowplow wings and the highways on which wings shall be used is specified in the Special Provisions.

The snowplow truck shall be equipped with in-cab controls for lifting and adjusting the wing. The wing functions must be quick acting and positively controlled. The wing control system shall have a "panic button" to provide for fast raising of the wing in emergency situations.

The wing adjustment mechanism shall be of a hydraulic telescopic type to allow for variations in the plow width. The minimum length of the wing blade shall be 2.70 metres.

Notwithstanding the minimum lengths of blades and wings, the operating configuration shall have a minimum effective total plowing width of 4.3 m when the wing is in the non-extended position and a minimum effective total plowing width of 5.0 m when the wing is fully extended.

The requirements for "minimum effective total plowing width" shall only apply to equipment purchased after September 1, 2002.

The wing shall have a rear facing clearance light mounted as close to the end of the wing as practical. The light shall be similar in size, shape and capacity as a Grote Part No. 56052 Red Clearance Light. The wing shall also be equipped with a 330 mm x 410 mm red flag mounted on its top outside edge.

Snowplow trucks with dual wings shall not be operated with both wings down at any time.

#### 52.1.3.7 **Snowplow Blades**

The Contractor shall supply snowplow blades and wing blades.

#### 52.1.3.8 **Spread Control Device**

All snowplow units shall be equipped with a spread control system capable of controlling the application rate of a sand, a sand and salt mixture or salt only. Only field proven products in service for at least one year will be considered unless otherwise approved by the Engineer.

Spread control devices shall be able to be calibrated to ensure consistent and uniform delivery of material to the road and must be compatible with the Department's Automated Vehicle Location System (AVLS).

Spread rate application settings shall be controlled from inside the cab of the vehicle.

The spread control system must be capable of performing the following functions:

##### 52.1.3.8.1 Sand/Salt Application Rate Control

Controlling an operator determined application rate to an accuracy of  $\pm 5\%$  for at least three different materials of varying densities. The system must also allow the operator to choose the type of load (material).

Displaying the actual application rate back to the operator when desired.

A "blast" setting which when activated will provide a maximum application rate.

A "passing" function which will allow the operator to stop the spinner and the main conveyor for short periods. There can be no delay in continuation of the spreading function after shutting off the passing function.

An error indicator which will notify the operator when the desired output of the main conveyor is less than expected due to an insufficient flow or high truck speed plus indicate other system related malfunctions.

#### 52.1.3.8.2 Spread Width Control

The spread width (spinner speed) must be controlled by the operator.

The spinner rotation direction must be reversible. The spinner must turn at the same speed when switched from one direction to the other while still on the same speed setting.

#### 52.1.3.8.3 Material Calibration

Material calibration will be required under the following conditions:

- prior to commencement of winter maintenance activities;
- when there is a change of materials or a change in hydraulic components; and
- when requested by the Engineer.

The spreader control device must be capable of providing a hard copy printout of the calibration results including kilograms per lane kilometre.

### 52.1.4 PROCEDURE

#### 52.1.4.1 **Snowplowing and Sanding**

Truck speeds shall not exceed 70 kilometres per hour. Individual truck speed shall be adjusted to meet snow, wind, highway and traffic conditions and the application requirements of the sand, salt or sand and salt mixture.

Except when performing Work on intersections, trucks shall always be operated such that travel is in the same direction as traffic.

The angle of the snowplow blade shall be adjusted to remove snow and ice from the roadway in an efficient manner and to the satisfaction of the Engineer.

Trucks shall pull over at reasonable intervals to allow traffic to pass. Generally, this interval shall be between 5 and 8 kilometres.

When trucks are operating as multiple unit groupings, they shall be spaced so that traffic can safely pass. Generally the distance between units, on the open highway, shall not be less than 800 metres, but is dependent on snow, weather, and traffic conditions.

When plowing the inside lanes into the median, truck speed shall be adjusted to minimize the amount of snow deposited on the adjacent roadway.

On two-lane highways, truck speed and the angle of the plow blade shall be adjusted to minimize the amount of snow deposited on to oncoming traffic.

When plowing on intersections, crossovers, approaches or other "confined" areas, the Contractor shall ensure that equipment operates in a manner which does not create a hazard to traffic.

When approaching railway crossings, trucks shall have the plow raised sufficiently to clear the tracks. Snow or ice shall not be deposited on the crossing. Damage to the crossing shall be reported to the local railway authority and to the Engineer immediately. Windrows of snow shall not reduce the lateral sight distance of motorists nor obscure the motorists' vision of railway traffic.

When plowing overpass structures, the Contractor shall ensure snow is not plowed off the overpass onto the roadway below.

The Contractor shall ensure all truck lights are clear of snow, ice and other materials which may reduce the illumination of the lighting on the truck.

#### 52.1.4.2 **Application of Sand, Salt or Sand and Salt Materials**

Material application rates will be specified by the Engineer.

The Contractor shall maintain a sand/salt usage inventory system, which shall include daily quantities of sand and salt usage from each material stockpile or salt shed for the particular winter segment worked.

The Contractor shall provide this information to the Engineer on a daily basis. The Engineer will provide a data form for the reporting of this information.

Generally, material applications shall be carried out at speeds up to 60 kilometres per hour. However, the individual truck speed shall be adjusted to account for weather, traffic, highway conditions and the type of material being applied.

Unless directed otherwise by the Engineer, the Contractor shall adjust the spinner speed to ensure the spread of ice control materials in the following manner:

**On a Straight-a-Way** - The Contractor shall concentrate the placement of ice control materials on the crown area of the road. The crown is designed so that positive surface drainage occurs on both sides of it. If ice control materials are placed on the crown area, then the brine formed by salt and the subsequent melting of snow and ice will drain off the road in two directions.

**On a Curve** - The Contractor shall place ice control materials on the high side of the curve so that any melting which may occur will run down the face of the curve and off the roadway surface.

**On Multiple-Lane-Highways** - The crown is usually in the middle of the roadway. The Contractor shall place ice control materials on one lane or two lanes at a time but starting with the lane or lanes closest to the roadway crown.

The deflector on the spinner must be regularly checked to ensure proper placement of the material on the roadway. Centre mount spinners shall be equipped with deflectors on both sides.

#### 52.1.5 COMMENCEMENT OF WORK

The Contractor shall ensure that equipment and operators are available for work 24 hours a day, 7 days a week and that the loader and a minimum of 2/3 of the trucks assigned by the Contractor per his designated sand/salt sites or snowplow truck storage locations are ready to commence work within 1 hour following the requirement for snow removal or ice control activities. The remaining trucks shall be ready to commence work within 2 hours following the requirement for snow removal or ice control activities. Work will commence at the stockpile site, equipment shop or any other location so designated by the Engineer.

During periods of inclement weather in winter months, at least 90% of the Contractor's snowplow truck fleet in each CMA shall be made available at all times to commence work. Spare trucks may be used to supplement the shortfall of these trucks. Any delays in commencing work, including delays due to breakdowns, may result in the assessment of penalties in accordance with Specification 52.1.9.3.

The Contractor shall provide a maximum of three telephone numbers of contact persons authorized to receive a Work Order for snow and ice control work. The Engineer shall be notified at once and in written form, of any changes to these telephone numbers. A fax transmission is considered a written form.

#### 52.1.6 SNOW PLOW TRUCK AND LOADER STORAGE

The storage location for each truck will be determined by the Contractor using the method detailed in the Request for Proposals with the exception that the Department may identify critical areas which must contain a specified number of trucks. Any such areas and the associated truck requirements are identified in the Special Provisions.

All snow plow trucks shall be stored in an enclosed structure where the temperature is maintained at a minimum of 4°C throughout the Availability Period as specified in the Special Provisions.

Loaders shall be stored at the sand/salt storage locations and shall also be equipped with internal electrical heaters.

#### 52.1.7 AVAILABILITY RATES

##### 52.1.7.1 **General**

Daily Availability Rates are payments made to the Contractor for having snow removal and ice control trucks and operators available to commence work during the winter season. There will be two separate availability rates included in the unit price schedule, one for trucks and another for operators. The rates apply individually to trucks and operators, and will be paid whether the truck and operator is performing the Work or are simply available to perform the Work described herein.

In the event of heavy snowstorms or other unseasonable weather which occurs outside of the period specified in the Special Provisions for Availability, the Contractor shall make sufficient trucks and operators available at the earliest possible time. In these cases, the Availability Rates will be paid for trucks and operators that were made available to work on the days outside of the specified time period for Availability. Heated Storage will not be paid for trucks made available to work outside of the specified Availability period.

Although the responsibility of monitoring approaching storms and weather conditions rests with the Maintenance Contractor, the Department may, from time to time, request that the Contractor prepare for an oncoming storm outside of the specified period for Availability. If this occurs the Availability Rates will be paid for all trucks and operators made available by the Contractor upon the Department's request, regardless if they worked or not, until such time that it is agreed the storm has passed.

The number of trucks and operators required for each area, and the dates they are to be available for work will be identified in the Special Provisions. The number of operators will be equivalent to, or greater than the number of trucks specified depending on highway traffic volumes and levels of service required for the highways being serviced in an area.

If, during the term of the Contract, additional snow plow trucks or operators are required as a result of a change in scope in a Contract Maintenance Area, the Availability Rate will be paid for the applicable period each additional truck and/or operator is required, with the exception that trucks which have completed 13 full years of service do not qualify for availability as described below.

#### 52.1.7.2 Trucks

The availability rate will not be paid for "spare" trucks which are not in use. The Availability Rate will not be paid for any trucks that have completed 13 full years of service as determined by the designated model year assigned by the manufacturer and year end of each winter season (June 1). For example, all 2000 model year trucks will be deemed to have completed 13 full years of service on June 1, 2013 and no further truck availability rate payments will be made. Operator availability rates will continue to be paid for these trucks.

During periods of snowstorms, the contractor shall provide a minimum availability of 90% of the snowplow trucks designated for each CMA during the entire snowstorm event. Additionally, any shop which has three (3) snow plow trucks or less assigned to it must maintain 100% availability at all times during the period specified in the Special Provisions for Truck Availability. Failure to provide the required snowplow truck availability, as specified herein, will result in the assessment of penalties in accordance with Section 52.1.9.3.

The Engineer shall be notified of any temporary relocations of snowplow trucks as soon as practical. Permanent reassignment of a snowplow truck will be subject to the approval of the Engineer. Failure to notify the Engineer of a temporary relocation, or to obtain approval for a permanent reassignment, of a snowplow truck may result in continuance of penalties assessed for availability.

#### 52.1.7.3 Operators

Operator Availability will only be paid for operators who are full-time operators or full-time seasonal operators for winter maintenance. Full-time operators and full-time seasonal operators are those who are available during the Availability period, and who can meet the requirements of specification 52.1.5; Commencement of Work. Full-time operators or full-time seasonal operators who are not undertaking winter snow and ice control operations are expected to be available for other work as required and authorized by the Department. The availability rate will not be paid for "spare" operators, except when required as a temporary substitute for a full time operator as approved by the Engineer.

Also, Operator Availability will be paid for one operator for each sub-contractor truck engaged by the Contractor to meet the terms of the Contract, and which is available to work during the availability period. An additional or second operator provided by a sub-contractor for his truck(s) will not be included for Operator Availability payment. The contractor shall provide a list of snowplow operators that worked during the periods of snowstorms.

If the Engineer requests a Road Inspection in accordance with Specification 53.39, Highway Maintenance Work, the Contractor has the option of using regular snow removal equipment operators to perform the inspection. Any such use of equipment operators, will not compromise the Contractor's entitlement to the Availability Rates and the employee and equipment will be considered to be available to commence work as defined.

#### 52.1.7.4 Loaders

If the Contractor is unable to provide a loader within five (5) hours on any given day, then the "Availability Rates" will not be paid for all trucks and operators stationed at that designated site.

### 52.1.8 PAYMENT ADJUSTMENTS

#### 52.1.8.1 General

Payment adjustments for snowplow truck usage will be applied yearly at the end of the Department fiscal year. Payment adjustments are based on the total yearly snow plow truck hours accumulated during the



Department fiscal year, for all trucks within the Contract area boundaries. The total yearly snow plow truck hours are compared against the “Combined Truck Usage Footprint” to determine the payment adjustments.

#### 52.1.8.2 Footprint

The “Combined Truck Usage Footprint” is a range of the estimated total snow plow truck hours required within the Contract area boundaries each fiscal year. The Special Provisions will describe how the estimated snow plow truck hours was determined for each CMA.

The "Combined Truck Usage Footprint" is determined as follows:

- (i) the Special Provisions will provide the historical quantities of yearly snow plow truck hours for each Contract Maintenance Area (CMA) and the corresponding two lane equivalent kilometres used to determine the average yearly truck hours;
- (ii) the average yearly truck hours calculated for each CMA in the Contract will be combined to provide the Total Average Yearly Truck Hours;
- (iii) the “Combined Truck Usage Footprint” will be the Total Average Yearly Truck Hours +/- 5 %.
- (iv) the "Combined Truck Usage Footprint" will be adjusted annually at the end of each Department fiscal year, throughout the term of the Contract, prior to application of the year end payment adjustment. For each CMA, the total yearly snow plow truck hours accumulated during the fiscal year will be factored into the previous calculation, and the highway network for each CMA will be adjusted accordingly to account for increases/decreases in the two lane equivalent kilometres.
- (v) The Department’s fiscal year runs from April 1 to March 31 of the following year. If the first fiscal year of the Contract is less than a full fiscal year, then the snowplow truck average yearly hours referred to in item (i) of this section will be reduced by an amount based on the Department's historical data for the snowplow truck hours occurring during the period from April 1 to the commencement date of the Contract. This adjusted quantity will be used to calculate the Footprint for the first fiscal year of the Contract only.

If the final fiscal year of the Contract is less than a full fiscal year, the Footprint and the payment adjustments for snowplow truck hours will not apply to the final fiscal year. Payment for snowplow truck usage in the final fiscal year of the Contract will be based on the actual number of hours used.

- (vi) if additional snowplow trucks are added to the Contractor's fleet for reasons other than highway network expansion, then such additions will have no impact on the calculation of the Footprint.

#### 52.1.8.3 Actual Yearly Hours Within The Footprint

If the actual total yearly snowplow truck hours fall within the Footprint then no payment adjustment will be applied.

#### 52.1.8.4 Actual Yearly Hours Exceed Footprint

If the actual total yearly snowplow truck hours exceed the Footprint, then a lump sum reduction in payment will be applied in accordance with the following formula:

$$\text{Lump Sum Reduction} = \text{WUP} \times \text{Actual Hours} \times 0.15 \times (1.05 - \text{Actual Hours} / \text{Footprint})$$

Where WUP is the Weighted Average Unit Price as calculated based on the total actual hours worked in the year by each category of truck.

#### 52.1.8.5 Actual Yearly Hours Are Less Than Footprint

If the actual total yearly snowplow truck hours are less than the Footprint, then a supplementary lump sum payment will be made in accordance with the following formula:

$$\text{Lump Sum Payment} = \text{WUP} \times \text{Actual Hours} \times 0.29 \times (0.95 - \text{Actual Hours} / \text{Footprint})$$

#### 52.1.9 MEASUREMENT AND PAYMENT

##### 52.1.9.1 Measurement

Measurement for snow removal and ice control (by truck) will be made in hours (to the nearest ¼ hour) for the number of hours a snow plow truck is working (moving) on roadways designated as billable by the Department. All snow plow truck hours worked will be measured and submitted using an Automated Vehicle Location (AVL) and billing system based on Global Positioning Satellites (GPS) for each snow plow truck over a 24 hour period. Manual submission of snow removal and ice control worksheets will be subject to penalty unless otherwise approved by the Department.

Measurement for payment will not include any stop times or breaks, without exception, which is defined as when the snow plow truck is not moving (stationary) on roadways designated as billable by the Department. Stop times are rounded to the nearest quarter hour (i.e. stationary <7.5 minutes is not considered a stop; stationary >=7.5 minutes is considered a stop), unless specified otherwise.

Measurement for the Truck Availability Rate will be made in days for the time both the snow plow truck and loader is available to engage in the Work during each 24 hour period commencing at 12:00 MST (midnight), for the dates specified in the Special Provisions.

Measurement for the Operator Availability Rate will be made in days for each 24 hour period commencing at 12:00 MST (midnight) an operator was available to work a full shift, for the dates specified in the Special Provisions.

If it is determined by the Engineer that a truck was not available for the day resulting in an operator not being able to work a full shift, then both the truck availability rate and operator availability rate for one operator will not be paid. If a truck is available to work but does not because there is no operator available to operate it within the 24 hour period then both the truck availability rate and operator availability rate for one operator will not be paid. Operator Availability will not be paid for operators that are not available to work as described in Section 52.1.7.3, Operators.

The Contractor will be required to submit a bi-weekly report, in a format as supplied by the department, on truck and operator availability.

Measurement for the snow plow wings and underbody plows will be in hours for the time the unit equipped with a wing and/ or underbody plow is performing Work.

##### 52.1.9.2 Payment

Payment for snow removal and ice control will be made at the applicable hourly rate bid per truck for "Snow Removal and Ice Control (Truck)" for the type of truck and auxiliary equipment specified in the Special Provisions. This payment will be full compensation for supplying and operating the truck including snowplowing, hauling materials from the stockpile site to the roadway, applying sand, salt or a

sand and salt mixture as required, and all labour, equipment (except wings, underbody plows and pre-wetting units when specified for), tools and incidentals necessary to complete the Work.

Supplying and operating loaders, and loading the trucks with sand, salt and pre-wetting chemicals will be considered incidental to the work and no separate or additional payment will be made.

No payment will be made for any breaks or stop times including, but not limited to, breakdowns, time spent changing blades, calibrating equipment, refueling, repairs or other servicing; nor for meal or coffee breaks.

Payment adjustments for truck usage will be applied on a lump sum basis. The lump sum adjustment will either be added to or subtracted from the total yearly snow plow truck payments as applicable.

Payment for Truck Availability Rate will be made at the daily rate per truck established by the Department in the Unit Price Schedule for "Snow Removal and Ice Control (Truck) - Availability Rate". This payment will be full compensation for ensuring both the snowplow truck and loader are available to commence the Work on any day during the period specified in the Special Provisions.

Payment for Operator Availability Rate will be made at the daily rate per operator established by the Department in the Unit Price Schedule for "Snow Removal and Ice Control (Operator) - Availability Rate". This payment will be full compensation for ensuring the operator is available to commence the Work at any time during the period specified in the Special Provisions.

Payment for indoor heated storage will be made at the daily rate per truck established by the Department in the Unit Price Schedule for "Snow Removal and Ice Control (Truck) - Indoor Heated Storage". This payment will be full compensation for storing the snowplow truck in an indoor heated facility. The indoor heated storage premium will be paid each day throughout the specified availability period provided the vehicle is available for work as defined in Section 52.1.7, Availability Rate.

Payment for wings will be made at the unit price bid per hour for "Snow Plow Wings." This hourly rate will be paid regardless of whether or not "winging" is required when performing the Work. Payment for pre-wetting units will be made in accordance with Specification 52.9.

Payment for underbody plows will be made at the unit price bid per hour for "Underbody Plow". This hourly rate will be paid regardless of whether or not the underbody plow is required when performing the Work.

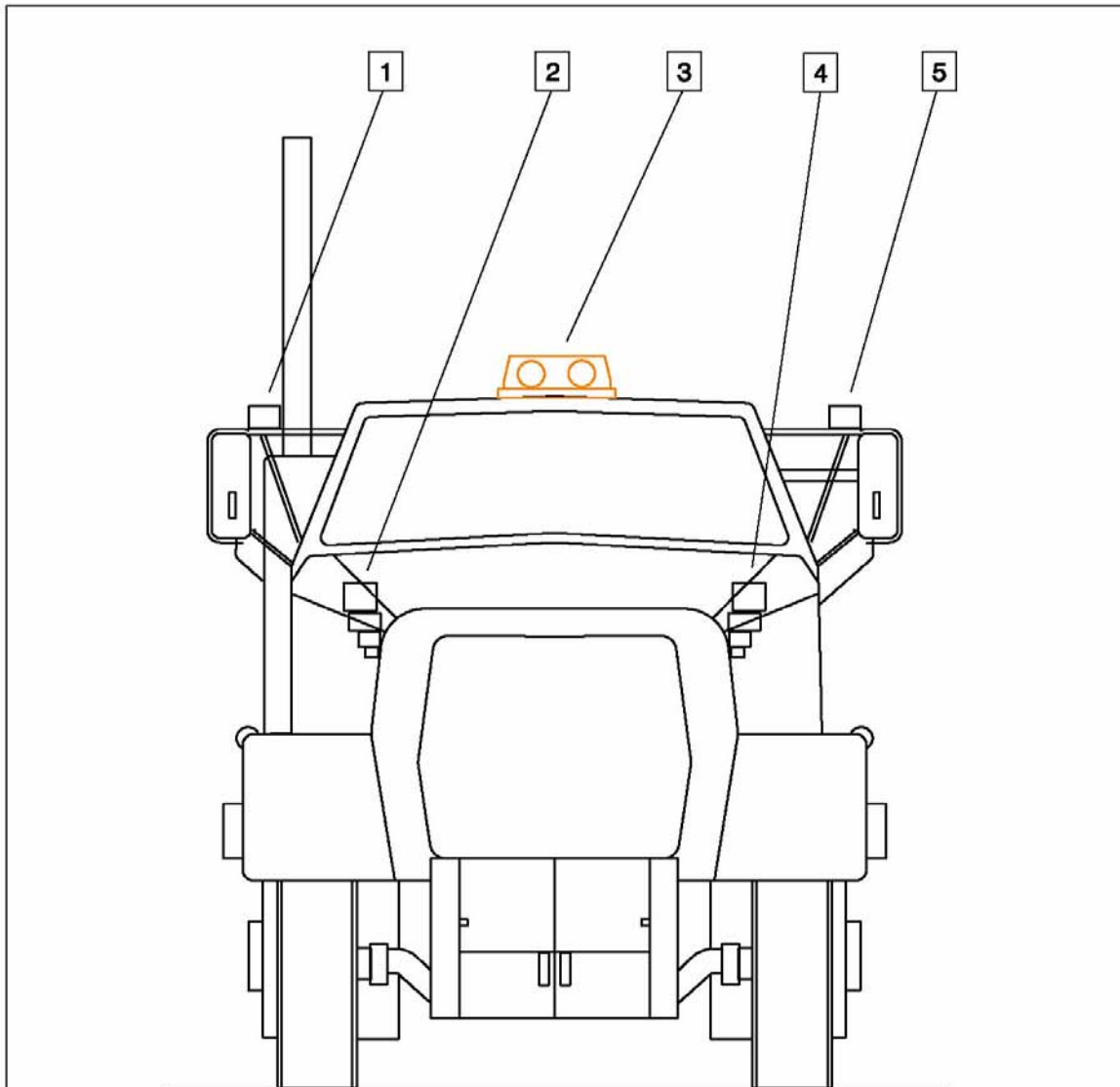
#### 52.1.9.3 **Delays in Commencing Work**

A penalty of \$100 per hour up to a maximum of \$500 per day will be assessed for each truck unavailable to commence work within the specified time.

A penalty of \$100 per hour up to a maximum of \$500 per day will be assessed for each hour the loader is unavailable to commence work within the one hour response time.

#### 52.1.10 WARRANTY

There is no warranty period for this Work.

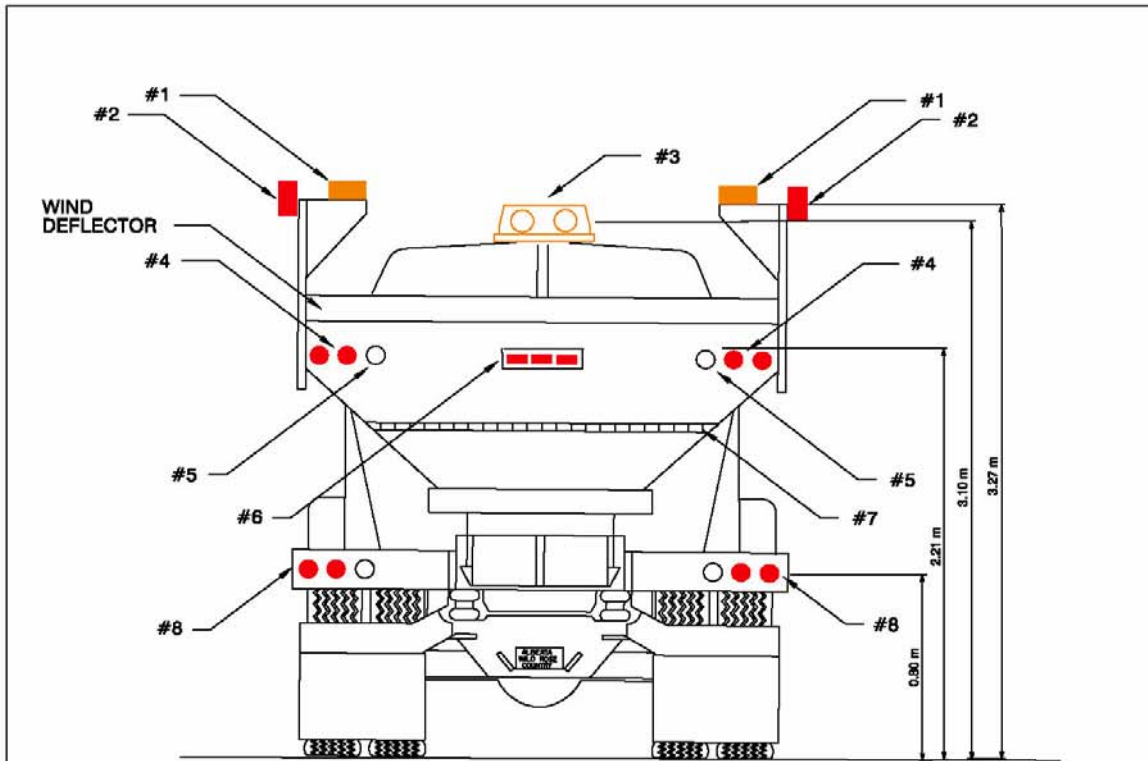


**FRONT VIEW**

- 1. R.H. Marker/Signal Lamp, Red/Amber
- 2. R.H. Plow Lamp
- 3. Dual Rotating Lamp Beacon or LED Mini Light Bar (Amber)
- 4. L.H. Plow Lamp
- 5. L.H. Marker/Signal Lamp, Red/Amber

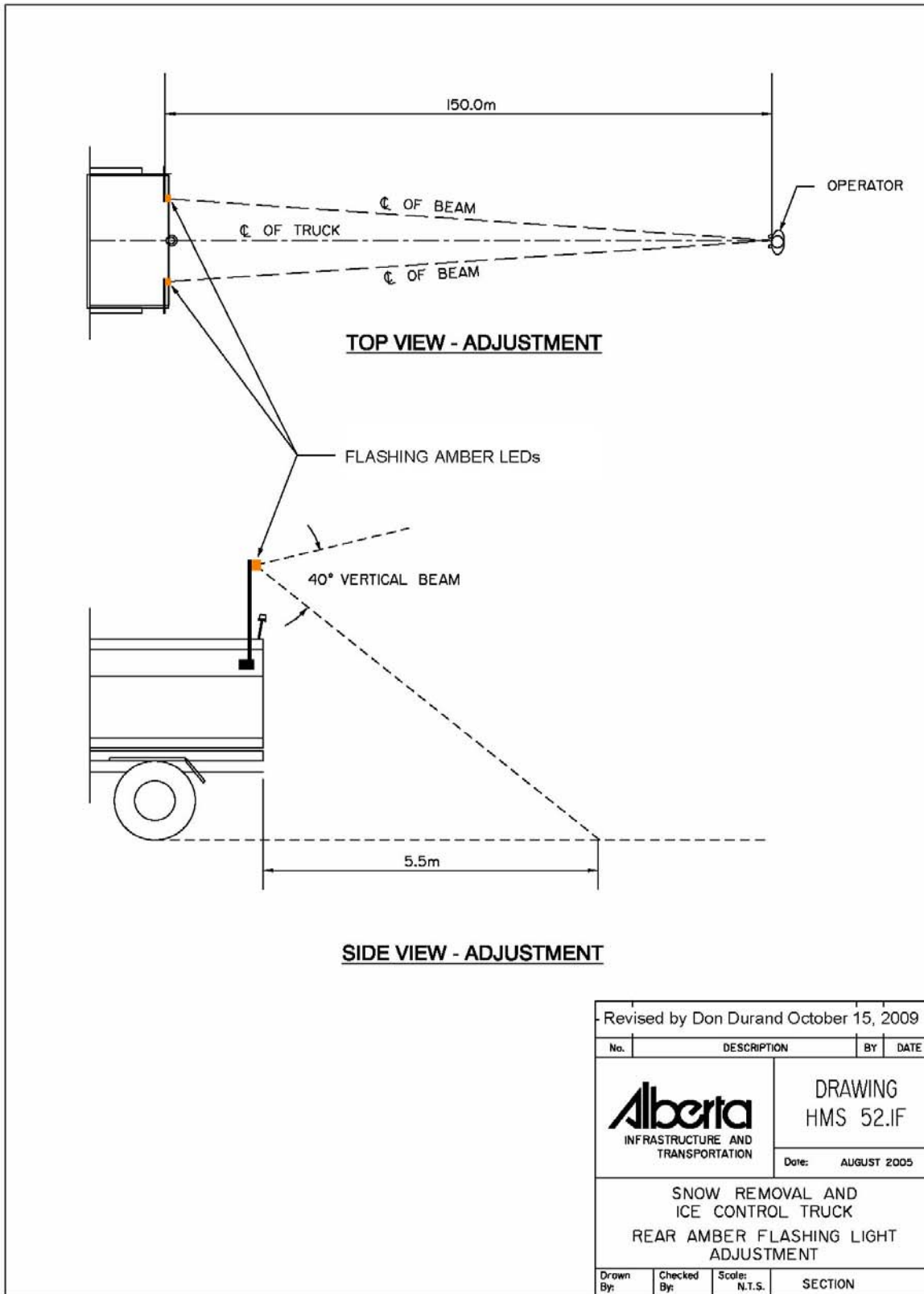
Revised by Don Durand October 15, 2009

No.	DESCRIPTION	BY	DATE
		DRAWING HMS 52.ID	
		Date: AUGUST 2005	
SNOW REMOVAL AND ICE CONTROL TRUCK FRONT LIGHTING STANDARD			
Drawn By:	Checked By:	Scale: N.T.S.	SECTION



- #1 - LED Lamp (Amber) with Minimum Surface Area of 131.25 sq. cm
- #2 - LED Lamp (Red) with Minimum Surface Area of 131.25 sq. cm
- #3 - Dual Rotating Lamp Beacon or LED Mini Light Bar (Amber)
- #4 - LED Lamps (Red) Stop-Tail-Turn with Minimum Surface Area of 78.5 sq. cm
- #5 - LED Lamp (Clear) Backup with Minimum Surface Area of 78.5 sq. cm
- #6 - LED Rear Identification Lights (Red)
- #7 - Reflective Tape (2 Strips)
- #8 - LED Lamps (Red and Clear) Stop-Tail-Turn & Backup with Minimum Surface Area of 78.5 sq. cm

Revised by Don Durand October 15, 2009			
No.	DESCRIPTION	BY	DATE
		DRAWING HMS 52.IE	
		Date: AUGUST 2005	
SNOW REMOVAL AND ICE CONTROL TRUCK REAR LIGHTING STANDARD			
Drawn By:	Checked By:	Scale: N.T.S.	SECTION



## 52.2 SNOW OR DEBRIS REMOVAL WITH LOADER OR TRUCK

### 52.2.1 GENERAL

The Work consists of removing snow or debris from selected areas such as intersections, bridges or around signs and guideposts. Generally this specification is intended to be used for snow removal, rockslides or mudslides only.

### 52.2.2 EQUIPMENT

The Contractor shall supply a rubber tired loader with a minimum bucket capacity of 1.3 cubic metres and equipped with revolving light, four way flashers and a slow moving sign.

The Contractor shall supply a tandem axle truck having a minimum legal capacity of 11 tonnes.

### 52.2.3 PROCEDURE

The loader shall travel in the same direction as the traffic when moving to and from worksites. Four way flashers shall be used during travel and the revolving light when working within the highway right-of-way.

Snow or debris shall be removed from the immediate work area and disposed of as directed by the Engineer.

### 52.2.4 RESPONSE TIME

In urgent situations, the Contractor shall respond within 1 hour of the issuance of the Work Order. In all other cases, the Contractor shall respond within 48 hours of the issuance of the Work Order.

### 52.2.5 MEASUREMENT AND PAYMENT

#### 52.2.5.1 **General**

Measurement will be in hours for the time required to complete the Work including hours spent deadheading the equipment to and from the worksite.

Payment for transporting the loader to and from the worksite, by truck, will be made as "Extra Work" in accordance with Specification 51.2, General (for Maintenance Work).

Payment will not be made for downtime for repair, refuelling or maintenance of equipment nor for the time spent hauling replacement equipment to the worksite. The Contractor will be compensated for two 15 minute coffee breaks per day (no deduction).

In urgent situations, where the Contractor is required to respond within 1 hour of the issuance of the Work Order, an additional payment will be made at the applicable unit price bid per occurrence for "Snow Removal - Premium" or "Debris Removal - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work. This payment will be made only once per Work Order regardless of whether the Work involves the use of the loader only, the truck only or both the loader and the truck.

The item for "Snow Removal - Premium" will normally only be used to remove snow in areas where avalanches block the roadway. In these cases, the loader and truck engaged in this Work will not be subject to the penalties in section 52.1.9.3.

52.2.5.2 **Snow Removal**

Payment will be made at the applicable hourly rate bid for "Snow Removal - Loader" and/or "Snow Removal - Truck". This payment will be full compensation for all labour, equipment, tools and incidentals necessary to complete the Work.

52.2.5.3 **Debris Removal**

Payment will be made at the applicable hourly rate bid for "Debris Removal - Loader" and/or "Debris Removal - Truck". This payment will be full compensation for labour, equipment, tools and incidentals necessary to complete the Work.

52.2.6 WARRANTY

There is no warranty period for this Work.



## 52.3 REMOVE, SUPPLY AND INSTALL SNOW FENCE

### 52.3.1 GENERAL

The Work consists of supplying and installing, maintaining and removing temporary snow fence on an annual basis.

Other types of snow fence, including permanent large fence and wooden lathe and plastic fence that are installed and left up, are not included in this specification. Any work required on these other types of fences will be specified in the Special Provisions or negotiated as Extra Work in accordance with Specification 1.2 General (For Maintenance Work).

### 52.3.2 MATERIALS

The Contractor shall supply all required snow fence material from the Alberta Transportation Products List. Fence material shall be a minimum of 1.22 metres in height and shall have a uniform porosity of 50% - 60%.

Salvaged snow fence material may be re-used provided it is in a condition suitable to the Engineer.

### 52.3.3 PROCEDURE

Snow fence shall be installed and maintained such that the maximum ground clearance is 300 mm and the minimum ground clearance is 150 mm. The snow fence material shall remain straight and plumb for the length of time that it is installed.

The Contractor shall maintain the newly installed snow fence for the duration of the warranty period.

The work area shall be restored to its original condition immediately upon completion of any installation, maintenance or removal operation. Restoration includes, but shall not be limited to the removal of staples and wire ties, which may have fallen on the ground, and the filling of post holes.

### 52.3.4 TIME TO COMPLETE

The Contractor shall complete the Work within 30 calendar days of the issuance of the Work Order.

### 52.3.5 MEASUREMENT AND PAYMENT

Measurement will be made in metres of the length of snow fence installed or removed.

Payment for supplying and installing new snow fence will be made at the applicable unit price bid per metre for "Snow Fence - Supply and Install". This payment will be full compensation for supplying and installing new snow fence material and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

Payment for removing snow fence will be made at the unit price bid per metre for "Snow Fence - Remove". This payment will be full compensation for removal and disposal or salvage of the snow fence materials and all labour, equipment, tools and incidentals necessary to complete the Work.

Payment for reinstalling salvaged snow fence will be made at the unit price bid per metre for "Snow Fence - Reinstall". This payment will be full compensation for hauling snow fence materials to the installation site(s), installing the previously salvaged snow fence, and all labour, equipment, tools and incidentals necessary to complete the work.

Maintaining the installed snow fence and restoring the work area to its original condition will be considered incidental to the Work and will not be paid for separately.

52.3.6 WARRANTY

The warranty period for the supply and installation of snow fence will extend to May 1, in the year following the installation or until a Work Order is issued for removal of the snow fence, whichever occurs first.

There is no warranty required for removal of snow fence.

**52.4 NOT USED**

## 52.5 SODIUM CHLORIDE TREATED SAND

### 52.5.1 GENERAL

The Work consists of mixing sodium chloride with untreated sand or treated (previously with salt) sand to produce a homogeneous mixture of newly treated material. The treated material shall be stockpiled inside enclosed structures at the Contractor's storage sites for use in winter maintenance activities.

### 52.5.2 MATERIALS

The Contractor shall be considered the owner of the newly treated material until such time as the material is placed on the roadway for use in winter maintenance activities.

Untreated sand shall be supplied by the Contractor in accordance with Specification 52.7, Supply and Stockpile Sand.

The Contractor shall supply the salt in accordance with Specification 52.8, Supply of Sodium Chloride (Salt).

### 52.5.3 EQUIPMENT

Mixing equipment shall be capable of uniformly mixing the sand and salt at the specified application rate.

### 52.5.4 STORAGE SITES

The Contractor shall supply all required storage sites. The minimum storage capacity for each Contract Maintenance Area will be specified in the Special Provisions. The actual location of the storage site(s) within each CMA shall be determined by the Contractor with the exception that the Department may identify critical areas which must contain a specified number of sites and/or capacity for material. Any critical areas and the associated requirements for storage sites will be identified in the Special Provisions.

All treated sand stored on the Contractor's maintenance facility shall be stockpiled inside enclosed structures, including treated sand that is intended for sale to third parties. Treated sand purchased from third parties for use on roads and highways under the Department's jurisdiction must also be stored inside enclosed structures. Furthermore, any third party site used for the supply of treated sand will require an Environmental Management Plan which meets the requirements of the Contract..

Enclosed structures shall be designed to accommodate a minimum of 125% of the annual provisional quantity of sand indicated in the Unit Price Schedule for each location, plus any additional sand that is intended for sale to third parties by the Contractor.

Enclosed structures shall be constructed in accordance with the approved Environmental Management Plans (EMPs).

Maintenance Facilities designated as High Priority Sites require enclosed structures capable of accommodating covered loading and mixing operations in addition to storage of the materials.

### 52.5.5 PROCEDURE

The quantity of salt treated sand to be produced will be specified in the Work Order.

The Contractor shall provide the Engineer a minimum of 48 hours notice prior to the commencement of the Work.

The Contractor shall mix the treated or untreated sand with salt at the specified application rate to yield a homogeneous mixture, and stockpile the newly treated sand at the Contractor's storage locations in accordance with the procedures identified in his Environmental Management Plan(s) for maintenance yards.

The Work shall be performed in a manner which prevents contamination of the stockpile of treated sand with oversized and/or foreign material.

The percentage of salt to be added will be recommended by the Contractor and, as agreed to by the Engineer, shall be sufficient to ensure that the newly treated sand is suitable for its intended use.

#### 52.5.6 SAMPLING AND TESTING

The Engineer may sample the completed stockpile to verify salt application rates at any time. The Contractor shall cooperate fully with the Engineer during the sampling and testing procedures.

#### 52.5.7 TIME TO COMPLETE

The Contractor shall complete the Work within the time period specified in the Special Provisions or as directed by the Engineer.

#### 52.5.8 MEASUREMENT AND PAYMENT

Measurement will be made in tonnes of treated sand stockpiled.

Payment will be made at the unit price bid per tonne for "Sodium Chloride Treated Sand - Mix and Stockpile" This payment will be full compensation for excavating the untreated or previously treated sand, excavating and applying the salt to the excavated sand, mixing and stockpiling the newly treated sand, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

Payment, by the Department, for the supply of sodium chloride treated sand material does not constitute the Department's ownership of such material, but rather reflects the Department's appreciation for the business cycles of the Contractor and the need of the Department to have the Contractor in a prepared state in advance of inclement winter weather. The Contractor acknowledges and agrees that the Contractor is considered the owner of the material until such time as the material is placed on the road.

As owner of the material, the Contractor acknowledges and accepts that the Contractor solely bears the responsibility for the safe storage of the said material so as to minimize the potential for any environmental contamination.

The cost of providing storage sites will be considered included in the unit price bid for "Indirect Operating Costs."

#### 52.5.9 WARRANTY

There is no warranty period for this Work.

## 52.6 CALCIUM CHLORIDE TREATED SAND

### 52.6.1 GENERAL

The Work consists of mixing a liquid calcium chloride solution with sand to produce a homogeneous mixture of treated material. The treated material shall be stockpiled inside enclosed structures at the Contractor's storage sites for use in winter maintenance activities.

### 52.6.2 MATERIALS

The Contractor shall supply a liquid calcium chloride solution containing 25%-35% by weight of calcium and magnesium chloride. The Contractor shall provide the Engineer with a certificate of analysis for each source used and each time the material characteristics change. The Contractor shall ensure that the certificate of analysis represents the material incorporated into the Work and that a copy of the applicable certificate accompanies each load arriving on site.

The Contractor shall supply the sand in accordance with Specification 52.7, Supply and Stockpile Sand.

The Contractor shall be considered the owner of the treated material until such time as the material is placed on the roadway for use in winter maintenance activities.

### 52.6.3 EQUIPMENT

The Contractor shall supply all equipment necessary to complete the Work. Requirements for major items of equipment are as follows:

- Mixing Equipment shall include metering devices capable of accurately measuring the total quantities of calcium chloride solution and sand processed as well as the rate of application.
- Belt Scales shall be certified by Weights and Measures Inspection Services of the Federal Department of Consumer and Corporate Affairs. They shall have sufficient capacity to accurately weigh material at a production rate which will allow mixing operations to be completed by the specified completion date.
- The most recent certificate for a scale shall be displayed at all times. In the event a certified scale is modified in any way, it must be re-certified prior to use.

### 52.6.4 STORAGE SITES

The Contractor shall supply all required storage sites. The minimum storage capacity for each Contract Maintenance Area will be specified in the Special Provisions. The actual location of the storage site(s) within each CMA shall be determined by the Contractor with the exception that the Department may identify critical areas which must contain a specified number of sites and/or capacity for materials. Any critical areas and the associated requirements for storage sites will be identified in the Special Provisions.

Storage sites shall meet the requirements specified in Specification 52.5.4.

### 52.6.5 PROCEDURE

The quantity of calcium chloride treated sand to be produced will be specified in the Work Order.

The Contractor shall provide the Engineer a minimum of 48 hours prior notice of the commencement of the Work.

The belt scale shall be used to weigh the untreated sand. The Contractor shall ensure the accuracy of the belt scale prior to commencement of the Work and in each instance the belt scale conveyor is moved within a mixing site. The belt scale shall be kept clean so that accurate measurements of the total amount of sand to be treated are obtained. The Contractor shall also ensure the accuracy of the calcium chloride delivery system.

The Engineer reserves the right to verify the accuracy of the belt and the calcium chloride delivery system at any time.

The Contractor shall mix untreated sand with liquid calcium chloride solution at the applicable specified application rate to yield a homogeneous mixture, and stockpile the treated sand at the Contractor's storage locations in accordance with the procedures identified in his Environmental Management Plan(s) for maintenance yards.

The Work shall be performed in a manner which prevents contamination of the stockpile of treated sand with oversized and/or foreign material.

The application rates for the various solution concentrations are as follows:

<b>Solution</b>	<b>Application Rate</b>
25%	24.2 litres of solution/tonne of sand
30%	19.3 litres of solution/tonne of sand
35%	15.2 litres of solution/tonne of sand

The Contractor shall target the completed stockpile of treated sand to contain 0.75% flake tonne equivalent by weight of untreated sand. The Engineer may reject the Work if this percentage is not achieved and if, in his opinion, the treated sand will not be suitable for its intended use.

#### 52.6.6 SAMPLING AND TESTING

The Engineer may sample the liquid calcium chloride solution and the completed stockpile to verify application rates. The Contractor shall cooperate fully with the Engineer during the sampling and testing procedures.

#### 52.6.7 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 52.6.8 MEASUREMENT AND PAYMENT

Measurement will be made in tonnes of untreated sand treated with liquid calcium chloride solution and incorporated into the completed stockpile.

Payment will be made at the unit price bid per tonne for "Calcium Chloride Treated Sand - Mix and Stockpile". This payment will be full compensation for weighing the untreated sand, supplying, storing and applying the liquid calcium chloride solution to the untreated sand, mixing and stockpiling the treated sand at the location specified, and all labour, material, equipment, tools and incidentals necessary to complete the Work.

Payment, by the Department, for the supply of calcium chloride treated sand material does not constitute the Department's ownership of such material, but rather reflects the Department's appreciation for the business cycles of the Contractor and the need of the Department to have the Contractor in a prepared state in advance of inclement winter weather. The Contractor acknowledges and agrees that the Contractor is considered the owner of the material until such time as the material is placed on the road.

As owner of the material, the Contractor acknowledges and accepts that the Contractor solely bears the responsibility for the safe storage of the said material so as to minimize the potential for any environmental contamination.

The cost of providing storage sites will be considered included in the unit price bid for "Indirect Operating Costs."

#### 52.6.9 WARRANTY

There is no warranty period for this Work.



## 52.7 SUPPLY AND STOCKPILE SAND

### 52.7.1 GENERAL

The Work consists of picking up sand from existing Department stockpiles or supplying sand when required, and stockpiling the sand at the Contractor's storage sites. The sand is used in winter maintenance activities.

### 52.7.2 MATERIALS

The Contractor shall supply sand in accordance with Specification 55.3, Aggregate Production and Stockpiling, to the gradation of Des. 5 Class 5, Des. 5 Class 8 or Des. 5 Class 10.

Designation 5	Percent Passing Sieve		
	Class 5	Class 8	Class 10
Metric Sieve (µm)			
10 000			100
8 000		100	
5 000	100	75-100	75-100
1 250	0-75	0-65	0-65
630			
315	0-30	0-30	0-30
160	0-18	0-18	0-18
80	0-10	0-10	0-10
% Fracture	N/A	N/A	N/A
Plasticity Index (PI)	NP-6	NP-6	NP-6
LA Abrasion % Loss	N/A	N/A	N/A

The designation and class of sand to be supplied will be specified in the special provisions.

A tolerance of three (3) percent in the amount passing the maximum size sieve will be permitted for the Des. 5 Class 5 and Des. 5 Class 8 material provided that all oversize material passes the next larger standard sieve size. For the Des. 5 Class 10 material, all material must pass the maximum sieve size. All sanding material not meeting specification must be approved by the Engineer.

Sand obtained from Department stockpiles may require processing.

The Contractor is advised that produced sand (oilfield waste sand) is prohibited from use as a stand alone or component material in all phases of highway maintenance and construction on Alberta Transportation's infrastructure.

The Contractor shall be considered the owner of the stockpiled sand until such time as the sand is placed on the roadway for use in winter maintenance activities.

### 52.7.3 SAND STORAGE SITES

The Contractor shall supply all required storage sites. The minimum sand storage capacity for each Contract Maintenance Area will be specified in the Special Provisions. The actual location of the storage site(s) within each CMA shall be determined by the Contractor with the exception that the Department may identify critical areas which must contain a specified number of sites and/or capacity for material. Any critical areas and the associated requirements for storage sites will be identified in the Special Provisions.

The actual amounts of sand required at each storage location will be recommended by the Contractor for approval by the Engineer.

#### 52.7.3.1 Procedure

The Contractor shall pick up sand from a Department stockpile and process the material when necessary, or supply sand from other sources of his choice.

#### 52.7.4 SAMPLING AND TESTING

The Contractor shall undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

Upon request and prior to delivery of any materials, the Contractor shall provide the sieve analysis results to the Engineer.

#### 52.7.5 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 52.7.6 MEASUREMENT AND PAYMENT

##### 52.7.6.1 General

Measurement will be made in tonnes of sand placed in stockpile.

Payment, by the Department, for the supply of sand material does not constitute the Department's ownership of such material, but rather reflects the Department's appreciation for the business cycles of the Contractor and the need of the Department to have the Contractor in a prepared state in advance of inclement winter weather. The Contractor acknowledges and agrees that the Contractor is considered the owner of the material until such time as the material is placed on the road.

As owner of the material, the Contractor acknowledges and accepts that the Contractor solely bears the responsibility for the safe storage of the said material so as to minimize the potential for any environmental contamination.

The cost of providing storage sites will be considered included in the unit price bid for "Indirect Operating Costs."

##### 52.7.6.2 Contractor Supply of Sand

Payment will be made at the unit price bid per tonne for "Sand - Supply and Stockpile." This payment will be full compensation for producing, hauling and stockpiling the sand at the Contractor's storage site, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

Payment for supply of aggregate will be made in accordance with Specification 55.4, Supply of Aggregate.

##### 52.7.6.3 Department Supply of Sand

Payment for hauling will be made in accordance with Specification 55.2, Hauling

52.7.6.3.1 Previously Processed Sand

Payment will be made at the unit price bid per tonne for "Sand - Pick up and Stockpile". This payment will be full compensation for excavating the processed sand from an existing stockpile, stockpiling the sand at the Contractor's storage site, and all labour, equipment, tools and incidentals necessary to complete the Work.

52.7.6.3.2 Unprocessed Sand

Payment will be made at the unit price bid per tonne for "Sand - Pick up, Process and Stockpile". This payment will be full compensation for excavating the sand from an existing stockpile, processing the sand, stockpiling the sand at the Contractor's storage site, and all labour, equipment, tools and incidentals necessary to complete the Work.

52.7.6.4 **Price Adjustments for Non-compliant Sand Gradation**

52.7.6.4.1 General

In the event that sand supplied by the Contractor is outside of the gradations specified for in the contract, then the Engineer will have the option of rejecting the material, or accepting it at a reduced rate in accordance with the Unit Price Adjustments as specified herein.

Unit price adjustments for sand material not meeting specified gradation limits shall be applied to the bid items for Contractor supply of sand in accordance with Specification 52.7.6.2.

This unit price adjustment does not apply to emergency sand brought in during a winter storm situation.

52.7.6.4.2 Testing

All QC and QA test results (from either the Contractor or the Department) for the applicable sand stockpile shall be used to determine the mean aggregate gradation. Mean adjustment points for mean aggregate gradations not meeting gradation limits as specified for in the contract, shall be determined as outlined in Tables 1a and 1b.

52.7.6.4.3 Calculation

A unit price adjustment for applicable sand material shall be calculated as follows:

$$UPAg = APg \times \$0.02$$

Where:

UPAg = Unit Price Adjustment for Gradation  
APg = Sum of Adjustment Points from Table 1a or 1b

The Unit Price Bid per tonne will be calculated as follows:

$$\boxed{\begin{array}{c} \text{Unit} \\ \text{Price} \\ \text{Per tonne} \end{array}} = \boxed{\begin{array}{c} \text{Contract Unit} \\ \text{Price Bid} \\ \text{Per tonne} \end{array}} - \boxed{UPAg}$$

**TABLE 1a – 8 mm and 10 mm  
MEAN ADJUSTMENT POINTS FOR DEVIATIONS FROM GRADATION LIMITS  
AND MAXIMUM DEVIATIONS ALLOWABLE**

LOT MEAN REQUIREMENTS	SIEVE SIZE $\mu\text{m}$		
	5000 <sup>(1)</sup> 1250 315	160	80
Mean Adjustment Points for Deviations outside of specified gradation limits	5 for each 1% Deviation	0.5 for each 0.1% Deviation	5 for each 0.1% Deviation
Maximum Allowable Deviation outside of specified gradation limits. <sup>(2)</sup>	5	5	2.5

**TABLE 1b – 5 mm  
MEAN ADJUSTMENT POINTS FOR DEVIATIONS FROM GRADATION LIMITS  
AND MAXIMUM DEVIATIONS ALLOWABLE**

LOT MEAN REQUIREMENTS	SIEVE SIZE $\mu\text{m}$		
	1250 <sup>(1)</sup> 315	160	80
Mean Adjustment Points for Deviations outside of specified gradation limits	5 for each 1% Deviation	0.5 for each 0.1% Deviation	5 for each 0.1% Deviation
Maximum Allowable Deviation outside of specified gradation limits. <sup>(2)</sup>	5	5	2.5

Notes:

<sup>(1)</sup> Include all applicable sieves up to one size smaller than top size.

<sup>(2)</sup> Sand material with gradation deviations exceeding the Maximum Allowable Deviation may be rejected for use at the discretion of the Engineer. If accepted for use by the Engineer, the Mean Adjustment Points calculated for the portion of the deviation exceeding this tolerance shall be doubled.

#### 52.7.7 WARRANTY

There is no warranty period for this Work.

## 52.8 SUPPLY OF SODIUM CHLORIDE (SALT)

### 52.8.1 GENERAL

The Work consists of supplying sodium chloride (salt) to the Contractor's storage facilities for the use in winter maintenance activities.

### 52.8.2 MATERIALS

#### 52.8.2.1 **General**

The Contractor shall be considered the owner of the salt until such time as the salt is placed on the roadway for use in winter maintenance activities.

The Contractor shall supply salt which is dry and free flowing, and the moisture content shall not exceed 1%.

The material shall be compatible with and easily dispensed by the Contractor's maintenance equipment.

The salt shall be supplied according to the following classifications.

**TYPE I**        -Fine  
**TYPE II**       -Medium  
**TYPE III**      -Coarse

The salt shall be free from dirt, sand or any other foreign matter.

#### 52.8.2.2 **Gradation of Salt**

Salt shall conform to the following applicable gradation requirements for the type of salt supplied.

Metric Sieve Size (Φm)	Fine (Type I) Percent Passing	Medium (Type II) Percent Passing	Coarse (Type III) Percent Passing
10 000		* 100	* 100
5 000	* 100	* 67-100	* 55-90
2 500	* 98-100	40-85	5-60
1 250	85-100	25-67	0-25
630	35-100	15-45	* 0-8
315	0-50	* 0-17	-
160	* 0-8	-	-
89	* 0-3	* 0-3	* 0-3

Note: The corresponding sieve sizes for the gradation limits marked with an asterisk will be considered gradation price adjustment sieves.

#### 52.8.2.3 **Chemical Composition**

The salt shall conform to the following chemical composition.

- Sodium Chloride (NaCl) - Minimum 95.0%
- Soluble Chloride - Minimum 98.0%

Soluble Chlorides include sodium, calcium, potassium and magnesium chloride.

### 52.8.3 SALT STORAGE SITES

The Contractor shall supply all required salt storage sites. The minimum salt storage capacity for each Contract Maintenance Area will be specified in the Special Provisions. The actual location of the salt storage site(s) within each CMA shall be determined by the Contractor with the exception that the Department may identify critical areas which must contain a specified number of sites and/or capacity for material. Any critical areas and the associated requirements for storage sites will be identified in the Special Provisions.

The actual amounts of salt to be delivered to each storage location will be determined jointly by the Contractor and the Engineer.

The Contractor shall ensure that the salt is protected from the weather at all times and not damaged in any way, including fracturing, compacting, segregating, et cetera.

All salt shall be contained in structures constructed on an impermeable floor of asphalt, concrete or other suitable material that is graded away from the centre of the structure for drainage purposes. The pad shall extend around the exterior of the structure and be graded away from the building such that runoff is prevented from entering the structure. The roof and exterior of the structure shall be constructed of waterproof material such that precipitation and moisture are prevented from entering the structure.

Loading of salt into the storage structure shall be performed using a conveyor or blowpipe system. The structure design shall be such that use of a blowpipe system does not result in salt drifting.

### 52.8.4 SAMPLING AND TESTING

#### 52.8.4.1 **General**

The Contractor shall be responsible for confirming that the materials received are the same as the materials on the bill of lading and shall reject materials obviously not in conformance with the requirements. Any contamination from hauling vehicles shall be reported to the Engineer immediately so that additional sampling and testing can be performed.

Upon request, the Contractor shall provide the Engineer with the following information for each load of salt delivered:

- Name of supplier
- Bill of lading number
- Batch number
- Origin of product
- Final destination of product
- Quantity in shipment
- Date and time of loading
- Date and time of delivery

#### 52.8.4.2 Quality Assurance Testing

The Department may conduct random testing for gradation quality and chemical analysis on any or all shipments.

In addition to any random job site testing, the Department will conduct a quality assurance program consisting of one random sample per 500 tonnes of material shipped from any one source. The sample (taken at the manufacturer) will be split into three representative smaller samples, one for the Department, one for the Contractor and one appeal sample. The Department will have the first sample tested and supply the results to the Contractor. If the Contractor does not agree with the Department's test results, he may appeal and request that the appeal sample be tested. The Department will have the appeal sample tested by an independent laboratory and the results will be binding on both the Contractor and the Department. If the results of the appeal sample tests indicate that the material is still subject to penalty, the Contractor shall bear the cost of additional testing. If the results of the appeal sample tests indicate that the material is not subject to penalties, the Department will bear the cost of the additional testing.

In cases where no appeal is made, any payment adjustments for quality will be based on the Department's single test result. In cases where an appeal is made, any payment adjustments will be based on the results of the appeal test only.

#### 52.8.5 PAYMENT ADJUSTMENTS

##### 52.8.5.1 Chemical Composition and Gradation

The following payment adjustments for non-conformance to the chemical composition and gradation requirements will be applied based on the results of the quality assurance testing. In all cases, shipments of salt found to be outside the gradation specifications or the chemical composition specifications or any other part of the specifications, will be subject to rejection at the discretion of the Engineer.

##### 52.8.5.1.1 Chemical Composition

#### Sodium Chloride

<u>Percent Chemical Composition</u>	<u>Penalty (% Reduction of Unit Price Bid)</u>
100 - 95	NIL
94.99 - 94.00	3
93.99 - 93.50	6
93.49 - 93.00	9
less than 93.00	12

#### Soluble Chlorides

<u>Percent Chemical Composition</u>	<u>Penalty (% Reduction of Unit Price Bid)</u>
100 - 98.0	NIL
less than 98.00	12

##### 52.8.5.2 Gradation

When the results are outside the limits of the "Gradation Price Adjustment Sieves" shown in Section 52.8.2.2, a price reduction of 5% (for each price adjustment sieve in non-compliance) will be applied to the applicable unit price bid for "Sodium Chloride (Salt) - Supply."

### 52.8.5.3 Salt Usage

Salt usage will be subject to payment adjustments based on a comparison of the total quantity of salt used on the road during each Department fiscal year and the "Combined Salt Usage Footprint" for the Contract. The "Combined Salt Usage Footprint" is a range of the total tonnes of salt estimated to be used within the Contract area boundaries each fiscal year. The Special Provisions will describe how the estimated total tonnes of salt was determined for each CMA. The "Combined Salt Usage Footprint" is determined as follows:

- (i) the Special Provisions will provide the historical quantities of yearly salt usage for each Contract Maintenance Area (CMA) and the corresponding two lane equivalent kilometres used to determine the average yearly salt usage in tonnes;
- (ii) the average yearly salt tonnage calculated for each CMA in the Contract will be combined to provide the Total Average Yearly Salt Tonnage;
- (iii) the "Combined Salt Usage Footprint" will be the Total Average Yearly Salt Tonnage +/- 10 %.
- (iv) the "Combined Salt Usage Footprint" will be adjusted annually at the end of each Department fiscal year, throughout the term of the Contract, prior to application of the year end payment adjustment. For each CMA, the total yearly tonnage of salt used during the fiscal year will be factored into the previous calculation, and the highway network for each CMA will be adjusted accordingly to account for increases/decreases in the two lane equivalent kilometres.
- (v) The Department's fiscal year runs from April 1 to March 31 of the following year. If the first fiscal year of the Contract is less than a full fiscal year, then the average usage for salt referred to in item (i) of this section will be reduced by an amount based on the Department's historical data for salt usage occurring during the period from April 1 to the commencement date of the Contract. This adjusted quantity will be used to calculate the Footprint for the first fiscal year of the Contract only.

If the final fiscal year of the Contract is less than a full fiscal year, the Footprint and the payment adjustments for salt usage will not apply to the final fiscal year. Payment for Salt usage in the final fiscal year of the Contract will be based on the actual number of tonnes used.

Calculations to determine any salt usage payment adjustments will be performed once per year based on quantities used up to March 31 each year. Details of the calculations and payment adjustments are included in Section 52.8.7.2, Salt Usage Payment Adjustments.

### 52.8.6 TIME TO COMPLETE

The Contractor shall ensure storage facilities contain salt at all times during the winter months.

### 52.8.7 MEASUREMENT AND PAYMENT

#### 52.8.7.1 Supply of Salt

Measurement will be made in tonnes of salt placed in each storage facility, based on invoice and bill of lading quantities from the Contractor's suppliers invoice. Only quantities of salt intended for use in the Work will be measured for payment.

Payment will be made at the applicable unit price bid per tonne for "Sodium Chloride (Salt) - Supply", subject to any unit price adjustments applied for non-compliance with gradation and/or chemical composition requirements. These payments will be full compensation for supplying salt to the applicable storage facilities and all labour, materials, tools and incidentals necessary to complete the work.



Any payment adjustments for salt usage will be applied on a lump sum basis at the end of each Department fiscal year.

Payment, by the Department, for the supply of salt material does not constitute the Department's ownership of such material, but rather reflects the Department's appreciation for the business cycles of the Contractor and the need of the Department to have the Contractor in a prepared state in advance of inclement winter weather. The Contractor acknowledges and agrees that the Contractor is considered the owner of the material until such time as the material is placed on the road.

As owner of the material, the Contractor acknowledges and accepts that the Contractor solely bears the responsibility for the safe storage of the said material so as to minimize the potential for any environmental contamination.

The cost of providing salt storage sites will be considered included in the unit price bid for "Indirect Operating Costs."

#### 52.8.7.2 **Salt Usage Payment Adjustments**

##### 52.8.7.2.1 Total Quantity Used During the Fiscal Year

The quantity used during the fiscal year will be determined by the Engineer and will be based on the quantity delivered plus the quantity of salt existing in stockpile(s) at the beginning of the winter season, less the quantity remaining in stockpile(s) on March 31 and the quantity of any salt supplied to others. The quantity of salt supplied to others will be determined and recorded by the Contractor and provided to the Engineer upon request.

The quantity remaining in stockpile on March 31 each year will be determined by cross-sectioning the stockpiles. This quantity will be converted to tonnes using the conversion factor specified in the Special Provisions.

##### 52.8.7.2.2 Total Yearly Quantity Used Falls Within the "Combined Salt Usage Footprint"

If the total quantity of salt used within the Contract area boundaries during the Department fiscal year falls within the "Combined Salt Usage Footprint", no Salt Usage payment adjustments will be applied.

##### 52.8.7.2.3 Total Yearly Quantity Used Exceeds the "Combined Salt Usage Footprint"

If the total quantity of salt used within the contract boundaries during the Department fiscal year exceeds the "Combined Salt Usage Footprint", then a lump sum reduction in payment will be applied in accordance with the following formula:

$$\text{Lump Sum Reduction} = \text{WUP} \times \text{Actual Tonnes} \times 0.15 \times (1.05 - \text{Actual Tonnes} / \text{Footprint})$$

Where WUP is the Weighted Average Unit Price as calculated based on the total actual tonnage used in the fiscal year from each stockpile.

##### 52.8.7.2.4 Total Yearly Quantity Used is Less than the "Combined Salt Usage Footprint"

If the total quantity of salt used within the contract boundaries during the Department fiscal year is less than the "Combined Salt Usage Footprint", then a supplementary lump sum payment will be made in accordance with the following formula:

$$\text{Lump Sum Payment} = \text{WUP} \times \text{Actual Tonnes} \times 0.29 \times (0.95 - \text{Actual Tonnes} / \text{Footprint})$$

### 52.8.7.3 **Quality Payment Adjustments**

Quality payment adjustments will be applied for sodium chloride content, soluble chlorides content and gradation requirements. These adjustments are cumulative, and the total penalty to be applied will include the total penalties assessed to the three properties listed above, to a maximum payment adjustment of 30%.

Payment adjustments for quality will apply to 500 tonnes, or the amount shipped if less than 500 tonnes, and will be deducted as a negative amount on the next monthly estimate.

### 52.8.8 WARRANTY

There is no warranty period for this Work.

## 52.9 PRE-WETTING SYSTEMS

### 52.9.1 GENERAL

This specification covers the general requirements for the supply of truck mounted Pre-Wetting Systems to be used for spraying liquid chemical agents directly on sand, salt or sand and salt materials during spreading.

The Contractor shall supply all necessary equipment and materials required to provide a functional Pre-Wetting System capable of meeting the performance requirements specified herein.

Pre-Wettings systems that were approved for work with Alberta Transportation during the 2001/02 season will also be deemed acceptable. Pre-Wetting systems which are replaced during the term of the Contract, shall be replaced with systems meeting the requirements specified herein.

### 52.9.2 MATERIALS

#### 52.9.2.1 **General**

The Contractor shall obtain approval from the Engineer prior to ordering Pre-Wetting liquid chemical agents. The Contractor shall be responsible for confirming that the chemicals received are the same as the chemicals on the bill of lading and shall reject chemicals that are obviously non compliant.

The Department recognizes the following chemicals as effective Pre-Wetting agents:

- Sodium Chloride (typically 20% - 23% Concentration)
- Calcium Chloride (typically 30% - 36% Concentration)
- Magnesium Chloride (typically 26% - 32% Concentration)

Other Chloride and Non Chloride chemicals may be used for Pre-Wetting as approved by the Engineer.

Upon request, the Contractor shall provide the Engineer with the following information for each load of chemicals delivered:

- Product Data Sheet (listing of chemical and physical properties)
- Certificate of Analysis
- Name of supplier and manufacturer
- Bill of lading number
- Origin of product
- Final destination of product
- Quantity in shipment

#### 52.9.2.2 **Quality Control Testing**

The Contractor shall be responsible for quality control testing of Pre-Wetting chemical agents as directed by the Engineer, and shall provide the results of such testing upon request of the Engineer.

#### 52.9.2.3 **Storage**

The Contractor shall be responsible for the storage of liquid Pre-Wetting chemical agents in accordance with the approved EMPs. All storage tanks shall have a re-circulation system capable of preventing the settling of solids.

The Contractor shall provide a minimum storage capacity of 5 000 litres for each truck equipped with a pre-wetting system.

### 52.9.3 EQUIPMENT

#### 52.9.3.1 **General**

The Pre-Wetting system shall have a minimum of 3 output flow rate settings to accommodate light, medium and heavy Pre-Wetting of materials. The Pre-Wetting system shall be capable of sustaining a heavy flow rate of 25 litres of liquid chemical agent per tonne of treated sand during a normal sanding application rate of 600 kg/2 lane km at 60 km/hr (15 litres/minute flow rate equivalency).

The Pre-Wetting system shall be integrated with the spread control device and automatically increase, decrease, start and stop flow to match spreader activity. The Pre-Wetting system shall be designed such that maximum surface coverage of the materials is obtained.

Pre-Wetting systems shall be kept in good working condition at all times. The Contractor shall ensure that all components of the Pre-Wetting system are compatible with the liquid chemical agent(s) used.

All snow plow trucks equipped with Pre-Wetting systems shall be properly designed and engineered to safely operate under the combined load capacity of the sanding unit and Pre-Wetting tanks.

The number of trucks to be equipped with Pre-Wetting systems is specified in the Special Provisions.

#### 52.9.3.2 **Tanks**

The truck mounted tank capacity for liquid Pre-Wetting chemicals shall be sufficient to pre wet two full loads of treated sand at a constant heavy flow rate of 25 litres/tonne during an application rate of 600 kg/2 lane km at 60 km/hr.

For example, a tandem axle truck with an 8.5 m<sup>3</sup> hopper would require a minimum tank(s) capacity of 588 litres (8.5m<sup>3</sup> x 1.365 = 11.6t, 11.6t x 2 loads = 23.2t, 23.2t x 25 l/t = 588 litres).

#### 52.9.3.3 **Temperature Sensor**

The Pre-Wetting system shall include a dynamic infra red road and air temperature sensor. The sensor shall have separate displays for ambient air and road temperature values. The sensor display shall be mounted inside the cab and be positioned in an area visible to the operator.

#### 52.9.3.4 **Flow Meter**

All Pre-Wetting systems shall have a properly operating flow meter.

#### 52.9.3.5 **Calibration**

Calibration of Pre-Wetting systems will be required under the following conditions:

- prior to commencement of winter maintenance activities each year,
- when there is a change of Pre-Wetting chemical agents,
- whenever equipment is repaired or replaced, and
- when requested by the Engineer.

Pre-Wetting systems shall calibrated to an accuracy of +/- 10%.

#### 52.9.4 PRE-WETTING LOG

Upon request of the Engineer, the Contractor shall maintain a log of daily Pre-Wetting activities for each truck equipped with a Pre-Wetting system, and shall compile a monthly summary for each shop location.

Information recorded shall include time, air and road temperature, precipitation type, surface condition, type of chemical used, application rates, quantity used and results achieved.

The Engineer will provide data forms for the recording of this information.

#### 52.9.5 MEASUREMENT AND PAYMENT

Measurement for Pre-Wetting systems will be in hours for the time a truck equipped with a pre-wetting system is performing snow removal and ice control work.

Payment for Pre-Wetting will be made at the unit price bid per hour for "Pre-Wetting Systems". This hourly rate will be paid regardless of whether or not "Pre-Wetting" is required when the truck is performing snow removal and ice control work.

Measurement and payment for supply of liquid pre-wetting chemical agents will be specified in the Special Provisions. Payment for the supply of pre-wetting chemicals will not be considered to constitute ownership of the chemicals by the Department until such time that it is used for the purpose intended.

Payment for quality assurance testing of liquid pre-wetting chemicals will be made as "Extra Work" in accordance with Specification 51.2, General for Maintenance Work.

The costs associated with providing storage of liquid pre-wetting chemicals will be considered included in the unit price bid for "Indirect Operating Costs".

#### 52.9.6 WARRANTY

There is no warranty period for this Work.

## **52.10 GLOBAL POSITIONING SYSTEMS (GPS) AND AUTOMATED VEHICLE LOCATION SYSTEMS (AVLS)**

### **52.10.1 GENERAL**

This specification covers the basic requirements for the supply and use of GPS receivers/ recorders for Motor Graders and AVLS using GPS technology for Snowplow Trucks.

### **52.10.2 GPS FOR MOTOR GRADERS**

#### **52.10.2.1 General**

Motor graders servicing gravel roadways will be required to have a GPS receiver and recorder installed to track the movements of the grader while deadheading and working for the Department during both winter and summer activities. The gravel roadways that will require motor graders to have GPS receivers/ recorders will be identified in the Special Provisions. Typically, motor graders servicing long sections of gravel roads will be required to have GPS receivers/ recorders. Short and isolated sections of gravel roadway may be exempt from this requirement at the discretion of the Engineer.

#### **52.10.2.2 Equipment**

The GPS recorder must be capable of storing a minimum of eight days of data based on a twelve hour day and two minute recording interval. The stored data must be exported in a file format which is capable of being imported into Microsoft Excel or Microsoft Access. The positioning data shall be in Geographic Coordinate format (latitude/longitude) referenced to the WGS84 Datum. The GPS receiver must have positional accuracy of 15 metres or better (horizontally) without post-processing.

In addition to recording geographical positions, the system must also record the speed of the grader and the corresponding time that each position was recorded.

#### **52.10.2.3 Procedures**

Each motor grader's GPS recorded positioning data, as described above, shall be submitted to the Engineer in an electronic file along with the associated crew sheet at a minimum of every seven (7) days.

The data file must also include a corresponding highway number, control section and km point for each position recorded prior to submission to the Engineer. Depending on the sophistication of the GPS receiver, this may be accomplished directly in the field during recording (i.e. waypoint file), or can be done with the use of post processing software supplied by the Contractor.

The Contractor must maintain an archive of each motor grader's GPS positioning files for a minimum of one year, and make copies of these archives available to the Engineer on request.

### 52.10.3 AVLS FOR SNOWPLOW TRUCKS

#### 52.10.3.1 **General**

All snowplow trucks working for the Department shall be equipped with an AVLS hardware unit (owned by the Contractor) that uses GPS technology and operates in real-time mode. In addition to the real-time-position information, the AVLS units shall monitor, record and transmit such information as operator ID, vehicle ground speed, spread rate, material type, blast on/off, spreader pausing, pre-wetting on/off, pre-wetting rate, and plow and wing(s) positioning (up or down). The raw AVLS data shall be sent from each truck's unit to the Department's AVLS service provider in real-time so that the tracking results can be displayed by the AVLS service provider in real-time via the Internet. Also, the AVLS data shall meet the Department's automated billing system requirements as hosted by the AVLS service provider, and shall be fully compatible with the Department's Program Management Application (PMA), which will then form the basis for tracking and payment of snowplow truck hours worked.

#### 52.10.3.2 **Procedures**

Prior to the beginning of each winter season and start of the specified Availability period, the Contractor shall ensure that the AVLS hardware in each snowplow truck is functioning properly and communicating with the AVLS service provider's host through a commissioning and activation process. The AVLS service provider's host will be available for commissioning starting from September 15th of each year, the Contractor is encouraged to commence the yearly commissioning and activation process as early as possible.

It is the Contractor's responsibility to rectify all AVLS hardware problems and to notify the AVLS service provider of any automated billing software problems encountered throughout the winter season.

Unless otherwise approved by the Department, the Contractor shall submit all snowplow truck hours for payment using the AVLS automated billing system.

### 52.10.4 PAYMENT

#### 52.10.4.1 **GPS for Motor Graders**

Costs associated with supplying and maintaining the GPS equipment, including receivers/ recorders, antennas, any necessary hardware and post processing software, and providing the data to the Department will be considered incidental to the Work and no separate or additional payment will be made.

#### 52.10.4.2 **AVLS for Snowplow Trucks**

Costs associated with supplying and maintaining all components required for a fully functional real-time AVLS, including GPS receivers and antennas, communication devices, any spare AVLS units including associated communications charges, sensors and any necessary hardware, throughout the term of the contract will be the responsibility of the Contractor. The Contractor may wish to extract snowplow work hours and invoice information from the Department's PMA and upload it into the Contractor's own financial tracking system. Any associated software development or file conversion costs to enable transfer of PMA data to the Contractor's financial system will be the Contractor's responsibility.

All other system costs such as licensing, operating costs, airtime costs for communications, data management and software technical support costs will be the Department's responsibility.

### 52.10.5 WARRANTY

There is no warranty period for this Work.

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## 53.1 EXCAVATION AND BACKFILL

### 53.1.1 GENERAL

The Work generally consists of excavating subgrade soil and/or granular materials from gravel surface roadways or approaches for roadway strengthening, but also applies for all other excavation within the highway right-of-way with the exception of paved surfaces and culvert work. The excavated materials shall be salvaged, stockpiled, and reused as backfill or disposed of as directed by the Engineer.

### 53.1.2 PROCEDURE

The Contractor shall excavate material to the widths and depths specified by the Engineer. The excavated material shall be salvaged and stockpiled for use as backfill material or disposed of as determined by the Engineer.

Backfilling operations shall commence immediately following the completion of the excavation. If the salvaged material is used, it shall be placed and compacted in the excavated area to required thickness as directed by the Engineer. Any other granular material required for backfilling shall be produced and placed in accordance with the applicable specifications.

### 53.1.3 TIME TO COMPLETE AND SCHEDULING WORK

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

### 53.1.4 MEASUREMENT AND PAYMENT

#### 53.1.4.1 **Excavation**

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

Payment will be made at the unit price bid per cubic metre for "Excavation". This payment will be full compensation for excavating and salvaging or excavating and disposing of the material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Measurement and payment for the haul of excavated material designated for disposal will be made in accordance with Specification 55.2, Hauling.

#### 53.1.4.2 **Backfill**

Measurement for backfilling excavations with salvaged material will be in cubic metres based on the volume of the backfill material in its final compacted position.

Payment will be made at the unit price bid per cubic metre for "Backfill with Salvaged Material". This payment will be full compensation for placing and compacting the salvaged material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Measurement and payment for new granular used for backfilling excavations will be in accordance with the applicable specifications.

### 53.1.5 WARRANTY

There is no warranty period for excavation Work. The warranty period for backfilling material shall be 1 year.



## 53.2 PIT-RUN GRAVEL

### 53.2.1 GENERAL

The Work consists of placing pit-run gravel on gravel surface roadways, in excavations for pavement patching or culvert installations, or at any other areas specified by the Engineer.

### 53.2.2 MATERIALS

The Contractor shall pick up pit-run gravel from a source designated by the Engineer or supply designation 6, class 125 pit-run material in accordance with Specification 55.3, Aggregate Production and Stockpiling and Specification 55.4, Supply of Aggregate.

In lieu of the designation 6, class 125 material, the Contractor may use a select, free draining material with a maximum top size of 125 mm, provided such material is satisfactory to the Engineer.

### 53.2.3 PROCEDURE

Pit-run material shall be placed on the prepared area or in an excavation in a uniform manner and quantity, which will produce the required compacted thickness and width designated by the Engineer.

### 53.2.4 TIME TO COMPLETE AND SCHEDULING OF WORK

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order. This work shall be performed immediately following the excavation or preparation of the area to be treated with pit-run.

### 53.2.5 MEASUREMENT AND PAYMENT

#### 53.2.5.1 **General**

Measurement will be in cubic metres based on truck box measurement.

Payment for hauling will be made in accordance with Specification 55.2, Hauling.

#### 53.2.5.2 **Contractor Supply of Pit-Run**

Payment will be made at the unit price bid per cubic metre for "Pit-Run Gravel - Supply and Place". This payment will be full compensation for supplying, placing, and compacting the pit-run, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Payment for the supply of aggregate will be made in accordance with Specification 55.4, Supply of Aggregate.

#### 53.2.5.3 **Department Supply of Pit-Run**

Payment will be made at the unit price bid per cubic metre for "Pit-Run Gravel - Pick up and Place". This payment will be full compensation for picking up, placing, and compacting the pit-run material and all labour, equipment, tools, and incidentals necessary to complete the Work.

53.2.6 WARRANTY

When pit-run gravel is used as part of another maintenance activity such as pavement patching, the warranty period for the pit-run gravel will be the same as the warranty period specified for the applicable activity. Otherwise, there is no warranty required for this Work.

### **53.3 GRANULAR BASE COURSE**

#### **53.3.1 GENERAL**

The Work consists of placing crushed granular base course material on a prepared area or in an excavation.

#### **53.3.2 MATERIALS**

The Contractor shall pick up crushed granular base course material from a source designated by the Engineer or supply crushed granular base course material in accordance with Specification 55.3, Aggregate Production and Stockpiling and Specification 55.4, Supply of Aggregate, for the designation and class of material specified.

#### **53.3.3 PROCEDURE**

Granular base course material shall be placed on the prepared area or in an excavation so as to produce a well compacted and uniform surface to an elevation approximately 150 mm below the existing pavement surface or on a gravel roadway, to the final roadway surface elevation.

#### **53.3.4 TIME TO COMPLETE AND SCHEDULING OF WORK**

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order and immediately after excavating an area or placing and compacting other fill materials.

#### **53.3.5 MEASUREMENT AND PAYMENT**

##### **53.3.5.1 General**

Measurement will be in cubic metres based on truck box measurement. Payment for hauling will be made in accordance with Specification 55.2, Hauling.

##### **53.3.5.2 Contractor Supply of Granular Base Course**

Payment will be made at the unit price bid per cubic metre for "Granular Base Course - Supply and Place". This payment will be full compensation for supplying, placing, and compacting the granular base course, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Payment for the supply of aggregate will be made in accordance with Specification 55.4, Supply of Aggregate.

##### **53.3.5.3 Department Supply of Granular Base Course**

Payment will be made at the unit price bid per cubic metre for "Granular Base Course - Pick up and Place". This payment will be full compensation for picking up, placing, and compacting the granular base course material and all labour, equipment, tools, and incidentals necessary to complete the Work.

#### **53.3.6 WARRANTY**

When granular base course is used as part of another maintenance activity such as asphalt pavement deep patching, the warranty period for the granular base course will be the same as the warranty period specified for the applicable activity. Otherwise, there is no warranty required for this Work.

## 53.4 ASPHALT PAVEMENT CRACK SEALING

### 53.4.1 GENERAL

The Work consists of supplying crack sealant and sealing cracks in asphalt concrete pavement.

The contractor shall use the Cold Pour method unless otherwise requested by the Engineer. If the Hot Pour method is requested, it shall be paid by Extra Work.

### 53.4.2 MATERIALS

The Contractor shall supply the type and grade of asphalt/emulsified asphalt material generally accepted for this work from the Alberta Transportation Products list.

The use of other materials will be subject to the approval of the Engineer. In situations where the Contractor requests approval to use a material not included in the "Products List", he shall provide the Engineer with the following information prior to approval:

- Name and mailing address of crack sealant supplier and manufacturer
- Name of crack sealant product to be supplied
- Written confirmation from the manufacturer that the crack sealant to be supplied meets all specified

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

The Contractor shall supply the Engineer with the manufacturer's quality control test results, as identified in Table 53.4.2(A), for each batch of crack sealant when requested.

**Table 53.4.2(A)**

PRODUCT	QUALITY CONTROL TESTING REQUIREMENTS	
<b>COLD POUR EC-101</b>	a) Uniformity	TLT-226
	b) Viscosity	ASTM D562
	c) Solids Content	ASTM D6934
	d) Rate of Curing (24 hour)	TLT-230
<b>HOT POUR</b>	a) Softening Point	ASTM D36
	b) Penetration @ 25°C	ASTM D5
	c) Viscosity	ASTM D2170

Note: TLT refers to Alberta Transportation Laboratory Tests, which are available on the Department's website ([www.transportation.alberta.ca](http://www.transportation.alberta.ca))

### 53.4.3 PROCEDURE

The work area shall be a maximum of 3 kilometres in length.

No Work shall be performed during rain or snow or when the pavement surface or cracks are wet.

All cracks within the entire width of the pavement surface, which are between 5 mm and 25 mm in width, shall be sealed.

Prior to the application of crack sealant, the Contractor shall ensure that the road surface adjacent to the cracks is clean.

Hot Pour crack sealant shall be heated to within the temperature range specified by the manufacturer.

Crack sealant shall be applied when the outside temperature is within the manufacturer's specified temperature range. Crack sealant shall be applied so that the crack is flush filled immediately following application and a thin overband of sealant extends approximately 25 mm beyond the edges of the crack. Excess crack sealant shall be removed from the pavement surface immediately following application. Removal shall involve the use of a squeegee, starting from the centerline and proceeding to the shoulder.

Traffic shall be kept off sealed cracks until the crack sealant will not track under the action of traffic. 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 necessary, the Contractor shall supply one of the following blotting agents:

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

The use of other products shall be subject to the approval of the Engineer.

Fuel, asphalt, and any other spills shall be cleaned up to the satisfaction of the Engineer at the Contractor's expense.

The Contractor will be required to provide interim traffic markings when, in the opinion of the Engineer, crack sealing work covers significant portions of the existing roadway lines such that it becomes a safety concern. In such cases, interim traffic marking shall be done in accordance with Specification 53.13, Asphalt Pavement Surface Patching.

#### 53.4.4 SAMPLING AND TESTING

The Contractor shall retain copies of his supplier's QC testing results, and undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

The Contractor shall provide the Engineer with one representative sample of crack sealant material when requested by the Engineer.

#### 53.4.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, all applicable cracks must be treated as specified herein and at least 95% of the treated cracks must contain an adequate quantity 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.

#### 53.4.6 TIME TO COMPLETE

The Contractor shall complete the Work within 60 days of the issuance of the Work.

53.4.7 MEASUREMENT AND PAYMENT

Measurement will be in metres of the length of crack sealed.

Payment will be made at the unit price bid per metre for "Crack Sealing – Cold Pour". This payment will be full compensation for supplying and applying the crack sealant and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

The method of measurement of sealed cracks shall be agreed upon by the Engineer and Contractor prior to the work starting. Measurement for payment is considered incidental to the work.

Payment for cleaning the roadway surface at the Engineer's direction will be made in accordance with Specification 53.17, Roadway and Raised Median Cleaning.

When the Engineer directs the Contractor to apply one of the aforementioned blotting agents, a supplementary payment will be made at the unit price bid per length of crack treated for "Crack Sealing - Blotting." This payment will be full compensation for supplying and applying the blotting agent and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

When the Engineer has directed the Contractor to provide interim pavements markings, payment for labour and materials associated with interim pavement markings will be made as Extra Work.

53.4.8 WARRANTY

The warranty period for this Work shall be 20 days.

## 53.5 ASPHALT PAVEMENT CRACK ROUTING AND SEALING

### 53.5.1 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.

### 53.5.2 MATERIALS

The Contractor shall supply the type and grade of asphalt/emulsified asphalt material generally accepted for this work from the Alberta Transportation Products list.

The use of other materials will be subject to the approval of the Engineer. In situations where the Contractor requests approval to use a material not included in the Alberta Transportation Products List, he shall provide the Engineer with the following information prior to approval:

- Name and mailing address of crack sealant supplier and manufacturer
- Name of crack sealant product to be supplied
- Written confirmation from the manufacturer that the crack sealant to be supplied meets all specified

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

### 53.5.3 PROCEDURE

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 Engineer, 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 Engineer of the total when nearing the estimated amount shown on the Work Order.

Cracks shall be routed to the applicable cross-section shown on the drawing (CB6-10.6M1), keeping the crack in the centre of the rout cross-section.

Prior to the application of crack sealant, the road surface adjacent to the crack shall be cleaned ensuring all loose material and moisture is removed from the routed cracks and surrounding areas.

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.

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

- screened sand with a maximum topsize of 2 mm
- cement
- flyash

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

Fuel, asphalt, and any other spills shall be cleaned up to the satisfaction of the Engineer at the Contractor's expense.

The Contractor will be required to provide interim pavement markings when, in the opinion of the Engineer, crack routing and sealing work covers significant portions of the existing roadway lines such that it becomes a safety concern. In such cases, interim pavement marking shall be done in accordance with Specification 53.13, Asphalt Pavement Surface Patching.

#### 53.5.4 SAMPLING AND TESTING

The Contractor shall retain copies of his supplier's QC testing results (minimum requirement of cone penetration and flow) and undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

#### 53.5.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, the Work must conform to 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.

#### 53.5.6 TIME TO COMPLETE

The Contractor shall complete the Work within 120 days of the issuance of the Work Order.

#### 53.5.7 MEASUREMENT AND PAYMENT

Measurement will be in metres of the length of crack routed and sealed.

Payment will be made at the unit price bid per metre for "Crack Routing and Sealing". This payment will be full compensation for routing, cleaning, and drying the cracks, cleaning the pavement surface, supplying and applying the crack sealant, measuring and recording the length of cracks treated, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

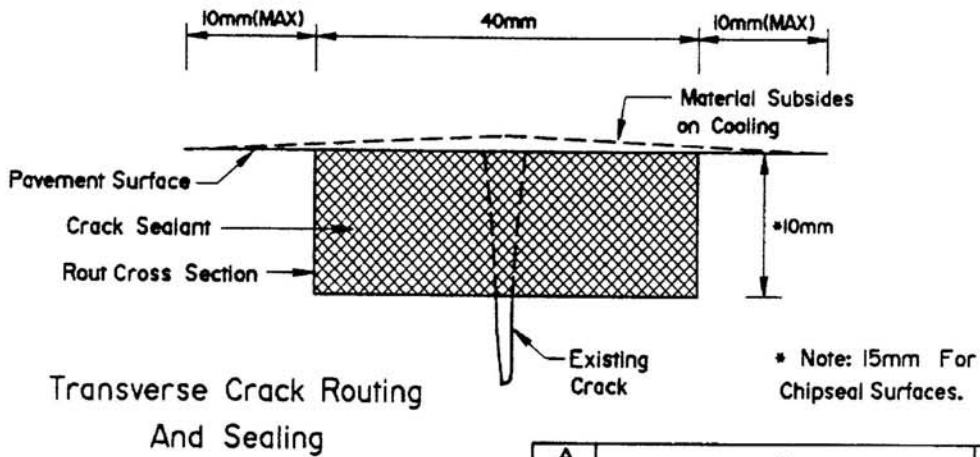
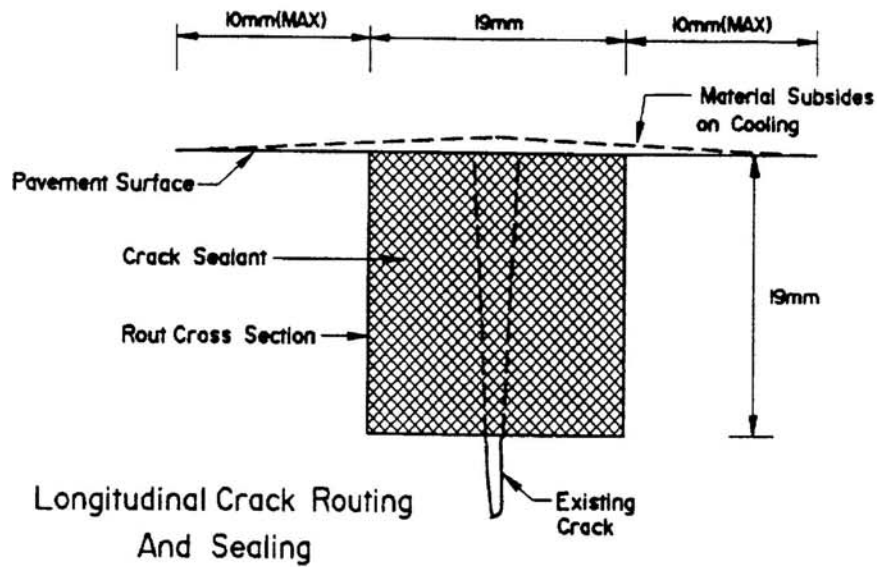
When the Engineer directs the Contractor to apply one of the aforementioned blotting agents, a supplementary payment will be made at the unit price bid per length of crack treated for "Crack Sealing - Blotting." This payment will be full compensation for supplying and applying the blotting agent, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.



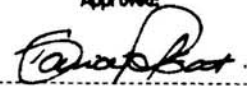

Payment for interim pavement markings will be made as Extra Work when the Engineer has directed the Contractor to provide the markings.

53.5.8 WARRANTY

The warranty period for this Work shall be 1 year. At the end of the warranty period at least 90% of all treated cracks must continue to be sealed.



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No.	REVISIONS	BY	DATE

Approved:  Executive Director, Roadway Engineering Branch	
Date: FEBRUARY 24, 1995	

TYPICAL CROSS SECTIONS  
CRACK ROUTING AND SEALING  
ASPHALT CONCRETE PAVEMENT

Prepared By: J.H.	Checked By: B.K.	Scale: N.T.S.	Dwg No.: CB6-10.6M1
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## 53.6 ASPHALT PAVEMENT SURFACE SEALING - FOG COAT

### 53.6.1 GENERAL

The Work consists of supplying and applying a liquid asphalt to the surface of paved roadways to seal small cracks and surface voids, to repair oxidation, and to prevent raveling or aggregate loss. Where a surface seal covers existing pavement markings, the Work will also include the application of interim pavement markings (spotting).

### 53.6.2 MATERIALS

The Contractor shall supply the type and grade of liquid asphalt/emulsified asphalt material from the Alberta Transportation Products list.

Materials generally accepted for this work are SS-1 or MC-30. The use of other asphalts shall be subject to the approval of the Engineer.

Paint and glass beads or self-adhesive, reflectorized pavement marking tape for interim pavement markings shall also be supplied from the Alberta Transportation Products list.

### 53.6.3 EQUIPMENT

The Contractor shall supply a self-powered pressure distributor capable of delivering a controlled and uniform application of liquid asphalt. The Contractor shall supply hand spraying equipment for areas inaccessible to the distributor.

### 53.6.4 PROCEDURE

Traffic shall not be permitted to travel on the surface seal until it has cured. Where a sealing of the entire roadway surface is required, the Contractor shall apply the surface seal to only one-half of the roadway at a time. The remaining half shall not be sprayed until the first application has properly cured.

Prior to the application of the asphalt material, loose dirt or other objectionable material shall be removed from the pavement surface by brooming or by other methods acceptable to the Engineer. No work shall be performed when the pavement surface is wet.

The surface seal shall be uniformly applied without streaking. The application rates will be as specified by the Engineer in the Work Order. Application rate ranges for the pre-approved liquid asphalts are:

- SS-1                    0.20 to 0.30 kg/m<sup>2</sup> (undiluted)
- MC-30                 0.20 to 0.30 kg/m<sup>2</sup>

Joints and seams shall not be excessively overlapped. Structures adjacent to the roadway shall not be spattered by the asphalt material. The Contractor shall remove, at his own expense, any spattering caused by his activities.

Areas missed or inaccessible to the distributor shall be treated using hand spray equipment.

#### 53.6.4.1 **Interim Pavement Markings (Spotting)**

Where a surface seal obliterates existing painted roadway lines, the Contractor shall provide interim pavement markings (spotting) on the sealed area. Spotting shall be applied immediately after the surface seal has cured and prior to darkness. The end points of the barrier lines shall be marked or otherwise referenced where applicable.

All spotting shall be applied using the same colour of paint as the permanent marking. Spots are to be 10 centimetres wide and 30 centimetres long, applied lengthwise to the road surface and shall delineate the travel lanes and/or both edge lines as applicable. The maximum distance between spots shall be 15 metres on tangent sections and 7.5 metres on curves.

When using line paint and beads, the spots and barrier line reference marks shall be completely covered with glass beads at the time of painting.

#### 53.6.5 SAMPLING AND TESTING

The Contractor shall retain copies of his supplier's QC testing results, and undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

#### 53.6.6 ACCEPTANCE CRITERIA

Evaluation of the Work will be based upon a visual inspection by the Engineer. To be acceptable, the area designated for treatment must be 100% uniformly sealed at the specified application rate.

The Contractor shall re-treat any deficient areas at his expense.

#### 53.6.7 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order

#### 53.6.8 MEASUREMENT AND PAYMENT

##### 53.6.8.1 **Surface Seal Application**

Measurement will be made in square metres of the area treated with a surface seal.

Payment will be made at the unit price bid per square metre as follows:

- Asphalt Pavement Surface Seal – Liquid Asphalt (< 2500 m<sup>2</sup>)
- Asphalt Pavement Surface Seal – Liquid Asphalt (2500 – 7500 m<sup>2</sup>)
- Asphalt Pavement Surface Seal – Liquid Asphalt (> 7500 m<sup>2</sup>)

This payment will be full compensation for the supply of the asphalt material, distributor application, and/or hand spraying, and all labour, equipment, tools and incidentals necessary to complete the Work.

Payment for any required cleaning of the roadway surface will be made in accordance with Specification 53.17, Roadway and Raised Median Cleaning.

##### 53.6.8.2 **Materials for Interim Pavement Markings**

Supplying and applying interim pavement marking paint and glass beads or self-adhesive, reflectorized pavement marking tape is incidental to the Work.

53.6.9 WARRANTY

The warranty period for this Work shall be 30 days.

## 53.7 ASPHALT PAVEMENT SURFACE AND CRACK REPAIR - SPRAY PATCH

### 53.7.1 GENERAL

The Work consists of supplying and applying a “tack coat” and a mixture of asphalt binder and clean aggregate, or pre-mixed “spray patch” material, to pavement cracks and contiguous deteriorated pavement (up to 15 cm in width) and other defective areas on the pavement surface.

### 53.7.2 MATERIALS

The Contractor shall supply clean, crushed aggregate meeting the following specifications in accordance with Specification 55.3, Aggregate Production and Stockpiling.

<u>Metric Sieve Size</u>	<u>Percent Passing</u>
10 000	100
5 000	20-100
2 500	5-40
1 250	0-10

The Contractor shall supply liquid asphalt for binder and tack purposes from the Alberta Transportation Products list. The type and grade of liquid asphalt shall be appropriate for the aggregate materials used. Pre-approved asphalt materials include HF-150S, HF-250S, RS-1K and WSPE-1.

The use of other asphalt binders will be subject to the approval of the Engineer.

### 53.7.3 PROCEDURE

Work shall not be performed when the atmospheric temperature at the work site is below 5° Celsius.

The Engineer will determine the longitudinal and transverse cracks and defective areas of asphalt pavement surface to be repaired.

The Engineer and the Contractor will decide if the work is crack repair or surface repair prior to the beginning of the work.

All loose and excess material shall be removed from in and around the open crack by sweeping, blowing or suction means.

Clean cracks and defective areas shall be sprayed with a tack coat of asphalt binder, and then sprayed with the combined asphalt and aggregate mixture.

Some over-spraying of the crack or defective area will be required to ensure a dense, smooth transition between the repaired crack and the adjacent undisturbed pavement surface.

Compaction of a repaired crack or defective area will only be required when specified in the Work Order. When compaction is required, the repaired area shall be compacted to ensure adequate embedment of the mixture into and over the crack or defective area.

Any loose or excess material shall be removed from the work area.

The Contractor will be required to provide interim traffic markings when, in the opinion of the Engineer, spray patch work covers significant portions of the existing roadway lines such that it becomes a safety

concern. In such cases, interim traffic markings shall be done in accordance with Specification 53.13, Asphalt Pavement Surface Patching.

#### 53.7.4 SAMPLING AND TESTING

The Contractor shall retain copies of his supplier's QC testing results, and undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

#### 53.7.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, the spray patch material must be adequately embedded into the crack or defective area and must provide a smooth transition between the treated area and the adjacent undisturbed pavement surface. Also, any loose aggregate material must be removed and the work site must be left in a clean condition.

Inadequate or excessive amounts of oil in the spray patch mix may result in rejection of the Work. The Contractor shall re-treat any failed areas at his expense.

#### 53.7.6 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 53.7.7 MEASUREMENT AND PAYMENT

Measurement will be in metres of the length of crack treated or square metres of defect area treated.

Payment will be made at the unit price bid per metre for "Asphalt Pavement Crack Repair - Spray Patch". This payment will be full compensation for sweeping and cleaning the cracks; supplying and applying tack coat; supplying the crushed aggregate and asphalt binder; producing, hauling and placing the mix; removal of excess or loose material; and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

Payment will be made at the unit price bid per square metre for "Asphalt Pavement Surface Repair - Spray Patch." This payment will be full compensation for sweeping and cleaning the area; supplying and applying tack coat, supplying the crushed aggregate and asphalt binder; producing, hauling and placing the mix; removal of excess or loose material; and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

Where compaction is specified in the Work Order, a supplemental payment for the equipment required will be made as Extra Work in accordance with Specification 51.2, General (for Maintenance Work).

The cost of supplying aggregate is included in the unit prices bid for Asphalt Pavement Crack/Surface Repair - Spray Patch and will not be paid for separately.

If, in the opinion of the Engineer, additional equipment (supplemental to what is normally used in the "Spray Patch" operation) is required to remove objectionable material from the cracks and defect areas, payment for such equipment will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

If the depth of the crack or area is excessive, the method of repair shall be agreed upon prior to the work beginning and additional payment or alternate method may be considered.

Payment for interim pavement markings will be made as Extra Work when the Engineer has directed the Contractor to provide the markings.

53.7.8 WARRANTY

The warranty period for this Work shall be 1 year. Reflective cracking of transverse and longitudinal cracks within the warranty period shall not be considered a warranty item.



## 53.8 ASPHALT PAVEMENT TRANSVERSE CRACK REPAIR - MILL AND FILL

### 53.8.1 GENERAL

The Work consists of repairing transverse cracks by milling a trapezoidal-shaped notch centred over and for the length of the crack, filling the notch with asphalt concrete pavement material and compacting the mix.

### 53.8.2 MATERIALS

The Contractor shall either "pickup" crack repair material from a source/asphalt plant to which the Department has access or supply the material, as directed by the Engineer.

Asphalt concrete crack repair material supplied by the Contractor shall be produced in accordance with Specification 53.11, Production of Asphalt Concrete Pavement. The ACP mix type will be Type 8 or an alternate product as stated on the Alberta Transportation Products List.

The Contractor shall supply the tack coat material in accordance with Specification 55.5, Supply of Asphalt. The type and grade of liquid asphalt for tack coat will be at the Contractor's discretion, unless otherwise specified by the Engineer.

### 53.8.3 EQUIPMENT

The Contractor shall supply:

- A dry process cold milling machine capable of milling a trapezoidal shaped notch as shown on Drawing CB6-3.35M1. Milling machines using water to cool the milling head shall not be permitted.
- Sweeping and blowing equipment capable of removing all loosened material from the milled notch and off the roadway surface.
- Hand spraying equipment for applying the tack coat.
- All other equipment necessary to complete the Work.

### 53.8.4 PROCEDURE

No Work shall be performed when the pavement surface is wet or when the atmospheric temperature at the worksite is below 5° Celsius.

The Engineer will determine which transverse cracks are to be repaired.

Repair of the transverse cracks shall consist of the following:

- The Contractor shall mill a trapezoidal-shaped notch centred over and for the length of the transverse crack as shown on diagram CB6-3.35M1.
- All loosened material shall be removed from the notch and the milled surfaces shall be left clean and dry. The milled material shall be swept to the shoulder of the road and disposed of on the sideslope. A tack coat shall be applied to all exposed pavement edges by means of hand spraying.

- The Contractor shall place and compact ACP material to the top of the milled notch.

53.8.5 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

53.8.6 ACCEPTANCE CRITERIA

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

- all milled cracks conform with the milling profile as shown on Drawing MS-002,
- the milling conforms to the path of the crack with no part of the crack outside or touching the edge of the milled cross-section,
- all milled cracks have been filled with ACP,
- the completed work provides a smooth transition between the infilled material and the adjacent undisturbed pavement surface, and
- all detritus has been properly disposed of and the work area left in a neat and tidy condition.

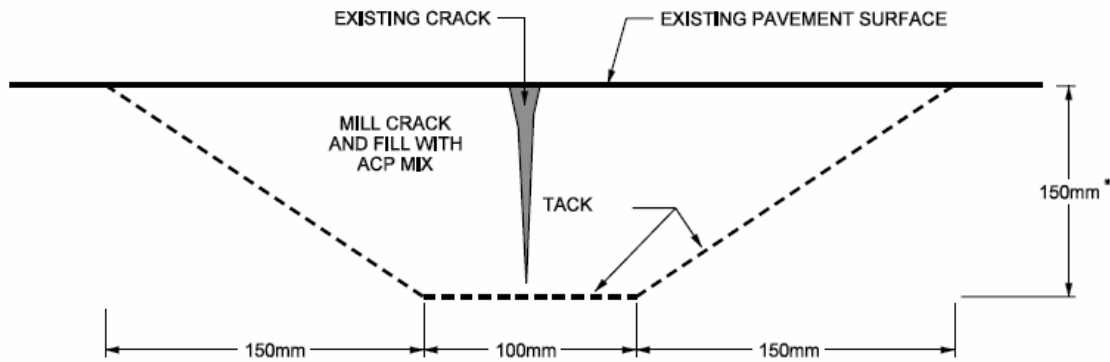
Treated cracks failing to meet these criteria will be repaired at the Contractor's expense.

53.8.7 MEASUREMENT AND PAYMENT

Payment for this work will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work) and as shown in the Work Order.

53.8.8 WARRANTY

The warranty period for this work shall be 1 year.



\* Or If depth of ACP is less than 150mm, mill to depth of ACP

NOTES:

1. This drawing supplements specification 3.35, "CRACK REPAIR - MILL AND FILL"

△			
△			
No.	REVISIONS	BY	DATE
Approved: ORIGINAL SIGNED BY ALLAN KWAN Executive Director, Technical Standards Branch			
Date: DECEMBER, 2002			
<h2>CRACK REPAIR DETAIL MILL AND FILL</h2>			
Prepared By: R.M.	Checked By: B.K.	Scale: N.T.S.	Dwg No.: CB6-3.35 MI

## **53.9 ASPHALT SURFACE TREATMENT**

### **53.9.1 GENERAL**

The Work consists of scarifying and salvaging existing asphalt bound aggregate and/or gravel surfacing, adding and blending additional crushed aggregate when required, adding liquid asphalt, and mixing and compacting the asphalt bound aggregate on the roadway in accordance with the specifications and plans herein.

### **53.9.2 MATERIALS**

#### **53.9.2.1 Aggregate**

When required, the Contractor shall provide gravel surfacing aggregate in accordance with Specification 53.29, Spot Gravelling or Specification 53.30, Gravel Surfacing as shown on the Work Order.

#### **53.9.2.2 Asphalt**

The Contractor shall supply the type and grade of asphalt material generally accepted for this work from the Alberta Transportation Products list.

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

Asphalt binder shall not be fluxed or cut back with oil or any other fluxing agent.

### **53.9.3 PROCEDURE**

#### **53.9.3.1 Preparing Subgrade Surface**

Where specified by the Engineer, the subgrade surface shall be prepared in accordance with the provisions of Specification 53.27, Maintenance and Preparation of Gravel Surface Roads and Snow Removal and Ice Control on Gravel and Paved Surfaces, prior to application of the asphalt surface treatment.

#### **53.9.3.2 General**

Unless otherwise specified, asphalt surface treatment materials shall be mixed and processed on the subgrade surface of the roadbed.

Application of asphaltic binder shall be performed only when the air temperature is 5°C or higher, and when the weather conditions are otherwise acceptable to the Engineer. The application temperature of the asphaltic binder will be as specified by the Engineer.

Placement of asphalt surface treatment materials on a frozen subgrade will not be permitted.

#### **53.9.3.3 Road Mixing Methods**

When the area to be treated already has surfacing gravel, with or without asphalt, this material shall be scarified with approved equipment only to the depth of the existing surfacing aggregate, windrowed uniformly upon the subgrade, additional aggregate added as directed by the Engineer, and mixed and dried by blading back and forth. When the material has been dried to a moisture content of 2% or lower, it shall be spread by blades and asphalt shall be uniformly applied by an approved type of pressure distributor at a rate between 45 litres and 90 litres per cubic metre, as directed by the Engineer. Lesser

quantities of asphalt may be required when aggregates being used have been treated previously. Care shall be taken to avoid rich or lean areas at the ends of each distributor run. Mixing shall start immediately, and shall continue until uniform colour is obtained and the cutback has been released by thorough aeration of the material.

Mixing shall be accomplished by pulvi-mixers, motor graders, gravel mixers, or other approved equipment with the end result being that the mixture is entirely uniform in asphalt content. Mixing shall be carried out between passes of the distributor, as well as subsequent to the completion of addition of asphalt.

In lieu of mixing the asphaltic binder as specified above, the Contractor may employ such other procedures as approved by the Engineer.

Mixing equipment used shall be controlled and operated on each pass to pick up and/or mix all the material to be treated, and to avoid cutting into the subgrade or picking up unmixed material on successive passes of the mixer.

The mixture shall then be brought to a single windrow, and from there bladed out to required cross-section and uniform depth. The surface shall then be rolled with pneumatic-tired rollers, or such other equipment as approved by the Engineer, in conjunction with light blading where necessary to maintain the required cross-section and grade. Rolling shall be continued until all aggregate is firmly embedded and the asphalt surface treatment layer is impervious to moisture penetration.

Spreading equipment shall be constructed and operated to produce a layer of material of uniform thickness and width. The type of spreading equipment used shall be approved by the Engineer.

Where the asphalt surface treatment has been aerated or mixed in a blanket type layer on the subgrade, it shall be windrowed to a uniform windrow prior to spreading and compaction.

Where spreading of the asphalt surface treatment mixture is carried out by motor grader, the material shall be thoroughly compacted by equipment specified above immediately upon completion of each portion of the spreading operation. Rolling shall be performed in such a manner as to avoid the formation of irregularities.

Where traffic must travel over the roadway surface during the curing period, the Contractor shall restrict traffic speeds sufficiently to prevent surface damage.

#### 53.9.4 SAMPLING AND TESTING

The Contractor shall retain copies of his supplier's QC testing results, and undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

##### 53.9.4.1 **Interim Pavement Markings (Spotting)**

Where newly constructed patches obliterate existing painted roadway lines, the Contractor shall provide interim pavement markings (spotting) on the patched area immediately upon completion of the patching work. The end points of the barrier lines shall be marked or otherwise referenced where applicable.

All spotting shall be applied using the same colour paint as the permanent marking. Spots shall be 10 centimetres wide and 30 centimetres long, applied lengthwise to the road surface and shall delineate the travel lanes and/or edge lines as applicable. The maximum distance between spots shall be 15 metres on tangent sections and 7.5 metres on curves.

If paint and beads are used, the spots and centerline barrier line reference marks shall be completely covered with glass beads at the time of painting.

#### 53.9.5 ACCEPTANCE CRITERIA

Evaluation of the work will be based on a visual inspection by the Engineer. The Work will be considered acceptable when;

- all materials are supplied in conformance with the specifications,
- the treated area:
  - is uniform in appearance with no areas exhibiting inadequate or excessive amounts of oil,
  - is properly compacted,
  - provides a smooth, level transition to the adjacent undisturbed surface,
- any loose aggregate material is removed and the work site left in a clean condition.

The Contractor shall re-treat any failed areas at his expense.

#### 53.9.6 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 10 calendar days of the issuance of the Work Order. When the Work is required expeditiously but is not urgent, the Engineer will request the Work be completed within 30 calendar days. In all other cases, the Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 53.9.7 MEASUREMENT AND PAYMENT

##### 53.9.7.1 **General**

Asphalt surface treatment will be measured by the square metre of surface area treated and will be classified according to the total treated area for each contiguous five kilometre section of roadway as follows:

- Areas up to 1000 m<sup>2</sup> will be classified as "Asphalt Surface Treatment - Patching".
- Areas from 1000 m<sup>2</sup> to 10 000 m<sup>2</sup> will be classified as "Asphalt Surface Treatment - Minor Repair".
- Areas over 10 000 m<sup>2</sup> will be classified as "Asphalt Surface Treatment - Major Repair" and will apply to reworking large areas of existing asphalt bound roadway.
- The treatment of previously untreated gravel roadways will be classified as "Asphalt Surface Treatment - New Construction".

##### 53.9.7.2 **Preparing Subgrade**

When the Engineer directs that the existing subgrade requires reworking, payment will in accordance with Specification 53.27, Maintenance and Preparation of Gravel Surface Roads and Snow Removal and Ice Control on Gravel and Paved Surfaces.

##### 53.9.7.3 **Repair of Existing Asphalt Bound Surfaces**

Payment for repairs to existing asphalt bound surfaces will be made at the applicable unit prices bid per square metre for "Asphalt Surface Treatment - Patching", "Asphalt Surface Treatment - Minor Repair" or "Asphalt Surface Treatment - Major Repair". Payments will be full compensation for scarifying the existing asphalt bound material, incorporating new aggregate material when necessary, applying asphalt

binder, mixing, spreading, compacting, and all labour, tools, equipment, and incidentals necessary to complete the Work.

Any damage caused to the roadway structure outside the patch area shall be repaired at the Contractor's expense.

Supplying and applying interim pavement marking paint and glass beads or self-adhesive, reflectorized pavement marking tape is considered incidental to the Work.

#### 53.9.7.4 **New Construction**

Payment for the construction of new asphalt bound roadway will be made at the unit price bid per square metre for "Asphalt Surface Treatment - New Construction". This payment will be full compensation for salvaging the existing surfacing gravel, adding and blending additional surfacing gravel when required, applying asphalt binder, mixing, spreading, compacting, and all labour, tools, equipment, and incidentals necessary to complete the Work.

#### 53.9.7.5 **Surfacing Gravel**

When additional surfacing gravel is required to complete the Work, payment will be made in accordance with Specification 53.29, Spot Graveling or Specification 53.30, Gravel Surfacing.

#### 53.9.7.6 **Supply of Asphalt**

Payment for the supply of asphalt binder will be made at the unit price bid per tonne for "Supply of Asphalt for Surface Treatment".

#### 53.9.7.7 **Accelerated Scheduling Premiums**

In urgent situations where the Contractor is required to complete the Work within 10 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Asphalt Surface Treatment - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work, including accelerated scheduling for all related Work.

In situations where the Contractor is required to complete the Work within 30 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Asphalt Surface Treatment - Interim Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work, including accelerated scheduling for all related Work.

#### 53.9.8 **WARRANTY**

The warranty period for asphalt surface treatment patches and repairs will be 120 days. The warranty period for new construction will be one year.

## 53.10 ASPHALT PAVEMENT POTHOLE PATCHING

### 53.10.1 GENERAL

The Work consists of repairing holes of up to 0.5 square metres in area and up to 100 millimetres in depth by cleaning the hole of loose material, filling the hole with an asphalt mixture, and compacting the mix to provide a smooth, hard surface and a smooth transition to the surrounding pavement.

### 53.10.2 MATERIALS

The Contractor shall supply asphalt stabilized base course material that meets the requirements of Specification 53.12, Production of Asphalt Stabilized Base Course Material, asphalt concrete pavement material that meets the requirements of Specification 53.11, Production of Asphalt Concrete Pavement, or commercially produced proprietary patching material satisfactory to the Engineer. Pre-approved proprietary mixes include QPR, Optimix, and IRR (Instant road Repair).

The Contractor shall supply tack coat materials in accordance with Specification 55.5, Supply of Asphalt. The type and grades of liquid asphalts for tack coats will be the choice of the Contractor unless otherwise specified by the Engineer.

### 53.10.3 PROCEDURES

The Contractor shall remove all loose material from the hole and tack coat the hole and the surrounding area to 0.15 m outside of the broken area.

The patching material shall be placed and compacted in the hole such that the completed patch provides a hard, stable surface which does not rut or otherwise distort under traffic loading and provides a smooth transition to the surrounding pavement surface.

### 53.10.4 SAMPLING AND TESTING

The Contractor shall retain copies of his supplier's QC testing results, and undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

### 53.10.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, patches must provide a dense, smooth and level transition between the treated area and the adjacent undisturbed pavement surface. Any loose material must be removed and the site left in a clean condition.

The Contractor shall re-treat any failed areas at his expense.

### 53.10.6 TIME TO COMPLETE

The Contractor shall complete the Work within 10 calendar days of the issuance of the Work Order.

### 53.10.7 MEASUREMENT AND PAYMENT

Measurement of pothole patching will be made by the kilogram for the type of mix used.

Payment will be made at the applicable unit price bid per kilogram for:



"Pothole Patching - ASBC/ACP"

"Pothole Patching - Proprietary Mix"

The applicable payment will be full compensation for removal and disposal of loose material, supplying and applying the tack coat, supplying the patching mix, hauling, placing and compacting the patching material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

When the Department supplies the asphalt mix, payment will be made unit price bid per kilogram for "Pothole Patching – Department Supplied Mix". Such payment will be full compensation for removal and disposal of loose material, supplying and applying the tack coat, hauling, placing, and compacting the patching material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Contrary to Specification 55.4, Supply of Aggregate, the cost of supplying aggregate for asphalt concrete pavement or asphalt stabilized base course patching material will be included in the applicable unit price bid for Pot Hole Patching and will not be paid for separately.

#### 53.10.8 WARRANTY

The warranty period for this Work shall be 90 days.

## 53.11 PRODUCTION OF ASPHALT CONCRETE PAVEMENT MATERIAL

### 53.11.1 GENERAL

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

### 53.11.2 MATERIALS

The Contractor shall supply asphalt binder in accordance with Specification 55.5, Supply of Asphalt, for the type and grade specified.

The Contractor shall supply aggregate in accordance with Specification 55.4, Supply of Aggregate.

The Contractor shall produce crushed aggregate in accordance with Specification 55.3, Aggregate Production and Stockpiling, for the designation and class of material specified.

The Contractor shall produce mixes conforming to the mix type specified. The Contractor shall assume responsibility for all costs incurred in verifying mix properties.

### 53.11.3 PROCEDURE

Asphalt concrete pavement (ACP) material of the Mix Type requested in the Work Order shall be produced to comply with Specification 3.50, Asphalt Concrete Pavement, of the latest edition of the Standard Specifications for Highway Construction.

Mixes designed to standards other than those of Alberta Transportation will be accepted if they are of similar quality as specified, and are subject to the approval of the Engineer.

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
- Retained Stability after 24 hour soaking at 60°C to be run at the recommended design asphalt content.

If requested by the Engineer, prior to producing the asphalt concrete mix, the Contractor shall calibrate the mixing plant or ensure the mixing plant they are obtaining material from is calibrated, and shall provide the Engineer with a calibration certificate and data attesting to the calibration.

### 53.11.4 SAMPLING AND TESTING

The Contractor may be required to provide the Engineer with a copy of the applicable mix design for the material supplied. If requested by the Engineer, the Contractor will be responsible for providing quality control test results that are representative of the asphalt mix being supplied. Minimum QC testing shall consist of an asphalt content determination (solvent extraction or ignition oven) and aggregate gradation analysis. Additional tests or increased frequency of testing will be as outlined on the Work Order or as ordered by the Engineer if the material quality is suspect.

The Engineer may perform additional testing to verify that the asphalt concrete mix complies with the specifications.

53.11.5 SCHEDULING OF WORK

The Contractor shall provide asphalt concrete mix materials to coincide with pavement patching operations as shown in the Work Order.

53.11.6 MEASUREMENT AND PAYMENT

Payment for the production of asphalt concrete pavement including the supply of asphalt binder, producing crushed aggregate and blend sand, and processing the mix will be included in the unit price bid for the work item for which the material is being used.

Payment for the supply of aggregate will be made in accordance with Specification 55.4, Supply of Aggregate.

53.11.7 WARRANTY

There is no warranty period for this Work.

## 53.12 PRODUCTION OF ASPHALT STABILIZED BASE COURSE MATERIAL

### 53.12.1 GENERAL

The Work consists of producing asphalt stabilized base course material for pavement patching and other work. Asphalt Stabilized Base Course shall consist of an intimate mixture of crushed aggregate and cutback or emulsified asphalt which is produced by plant mixing at elevated temperatures.

### 53.12.2 MATERIALS

The Contractor shall supply asphalt binder in accordance with Specification 55.5, Supply of Asphalt. Unless otherwise specified in the Special Provisions, asphalt binder for asphalt stabilized base course shall be MC-250, MC-800, HF-500 or HF-1000. The Contractor shall make the choice between these four products.

The Contractor shall produce crushed aggregate in accordance with Specification 55.3, Aggregate Production and Stockpiling, for the designation and class of material specified.

The Contractor shall supply aggregate in accordance with Specification 55.4, Supply of Aggregate.

### 53.12.3 PROCEDURE

The Contractor shall produce asphalt stabilized base course mixes which meet the following characteristic requirements at the design asphalt content:

#### **MIX DESIGN CHARACTERISTICS**

	<b>HF-500M or HF-1000M</b>	<b>MC-250 or MC-800</b>
Marshall Stability (N)	3000+	6700+
Air Voids	3% to 6%	3% to 6%

If requested by the Engineer, prior to producing the asphalt stabilized mix, the Contractor shall calibrate the mixing plant or ensure the mixing plant they are obtaining material from is calibrated, and shall provide the Engineer with a calibration certificate and data attesting to the calibration.

Production and stockpiling, when required, of the asphalt stabilized mix shall be in accordance with *Specification 3.5 – Asphalt Stabilized Base Course* of the latest edition of the *Standard Specification for Highway Construction* (where “Consultant” means “Engineer or his representative”)

### 53.12.4 SAMPLING AND TESTING

The Contractor shall be required, upon request by the Engineer, to provide a copy of the applicable mix design for the material produced.

The Engineer may perform additional testing to verify that the asphalt stabilized mix complies with the specifications.

### 53.12.5 SCHEDULING OF WORK

The Contractor shall provide asphalt stabilized base course material to coincide with pavement patching operations as shown in the Work Order.

53.12.6 MEASUREMENT AND PAYMENT

Payment for the production of asphalt stabilized base course, including the supply of asphalt binder, producing crushed aggregate and blend sand, and processing of the mix, will be included in the unit price bid for the work item for which the material is being used.

Payment for the supply of aggregate will be made in accordance with Specification 55.4, Supply of Aggregate.

53.12.7 WARRANTY

There is no warranty period for this Work.

## 53.13 ASPHALT PAVEMENT - SURFACE PATCHING

### 53.13.1 GENERAL

The Work consists of spreading and compacting asphalt bound aggregate mix (i.e.: asphalt concrete pavement, asphalt stabilized base course material, or proprietary mix), by means of paver, machine (e.g.: motor grader), or hand on a prepared pavement surface or in a shallow excavation to the lines and dimensions as directed by the Engineer.

Painting of interim traffic markings (spotting) and referencing of the ends of no passing zones (barrier lines) is included in the Work where patching obliterates the existing pavement markings.

### 53.13.2 MATERIALS

The Contractor shall either "pickup" patching material from a source/asphalt plant to which the Department has access, or supply the patching material, as directed by the Engineer.

Asphalt concrete patching material supplied by the Contractor shall be a coarse or fine mix produced in accordance with Specification 53.11, Production of Asphalt Concrete Pavement.

Asphalt stabilized patching material supplied by the Contractor shall be produced in accordance with Specification 53.12, Production of Asphalt Stabilized Base Course.

Commercially produced proprietary patching material supplied by the Contractor shall be either QPR, Optimix, or Instant Road Repair (IRR). The use of other commercially produced products shall be subject to the approval of the Engineer.

Paint and glass beads shall be supplied by the Contractor and shall comply with the requirements of the Alberta Transportation Products List. The Contractor may use self-adhesive, reflectorized pavement marking tape for interim pavement markings in lieu of paint and glass beads. Self-adhesive tapes shall also comply with the Alberta Transportation Products List.

### 53.13.3 PROCEDURES

Loose debris or other excess material shall be removed from the areas to be patched, by brooming or other methods, and a prime or tack coat applied. The Contractor shall remove and dispose of any failed Asphalt Concrete Pavement or Asphalt Stabilized Base Course in the area to be patched as directed by the Engineer.

For patching on existing pavement surfaces, the tack coat shall extend 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.

Patching material on the edges of a patch shall be "feathered" using rakes or lutes. Coarse material shall be removed from the patch edges.

Patching material shall be spread 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.

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 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 wheelpaths, 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.

#### 53.13.3.1 **Interim Pavement Markings (Spotting)**

Where newly constructed patches obliterate existing painted roadway lines, the Contractor shall provide interim painted pavement markings (spotting) on the patched area immediately upon completion of the patching work. The end points of the barrier lines shall be marked or otherwise referenced where applicable.

When paint is used, it shall be of the same colour of paint as the permanent marking. Painted spots are to be 10 centimetres wide and 30 centimetres long, applied lengthwise to the road surface and shall delineate the travel lanes and/or edge lines as applicable. The maximum distance between spots shall be 15 metres on tangent sections and 7.5 metres on curves.

If using line paint and beads, the barrier line reference marks (on centreline) and lane spots shall be completely covered with glass beads at the time of painting.

#### 53.13.4 SAMPLING AND TESTING

The Contractor shall retain copies of his supplier's QC testing results, and undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

#### 53.13.5 ACCEPTANCE CRITERIA

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

The Contractor shall re-treat any failed areas at his expense.

The Contractor shall remove any loose material and leave the site in a clean condition.

#### 53.13.6 TIME TO COMPLETE

##### 53.13.6.1 **Emergency Patches**

In situations where it is necessary to undertake immediate repairs, which are normally of a temporary nature, the Contractor shall complete the Work within 2 calendar days of the issuance of the Work Order.

##### 53.13.6.2 **Non-emergency Patches**

Under normal circumstances, the Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order. In more urgent situations, the Contractor shall complete the Work within 10 or 30 days of the issuance of the Work Order as determined by the Engineer.

### 53.13.7 MEASUREMENT AND PAYMENT

#### 53.13.7.1 **General**

Measurement will be in tonnes of patching material placed.

Payment for hauling from Department sources or from the closest Contractor's source of material acceptable to the Engineer will be made in accordance with Specification 55.2, Hauling.

Removal and disposal of any failed ACP and ASBC material will be paid as Extra Work.

Supplying and applying paint and glass beads will not be paid for separately but shall be considered incidental to the Work.

#### 53.13.7.2 **Department Supply of Patching Material**

Payment will be made at the applicable unit price bid per tonne for:

"Asphalt Concrete Pavement Patching (Paver) - Pickup and Place",  
"Asphalt Concrete Pavement Patching (Machine) - Pickup and Place",  
"Asphalt Concrete Pavement Patching (Hand) - Pickup and Place",

Payments will be full compensation for preparing the surface, supplying and applying the prime or tack coat, picking up, placing and compacting the asphalt concrete patching material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

When an Emergency Patch is required and material can be obtained from a Department Source, payment will be made at the unit price bid per tonne for "Emergency Patch - Pickup and Place". This payment will be full compensation for picking up, placing, and compacting the asphalt concrete patching material, the accelerated scheduling required to complete the Work within 2 days, and all labour, equipment, tools, and incidentals necessary to complete the Work.

#### 53.13.7.3 **Contractor Supply of Patching Material**

Payment will be made at the applicable unit price bid per tonne (for the type of mix specified) for:

"Asphalt Concrete Pavement Patching (Paver) - Supply and Place",  
"Asphalt Concrete Pavement Patching (Machine) - Supply and Place",  
"Asphalt Concrete Pavement Patching (Hand) - Supply and Place",  
"Asphalt Stabilized Base Course Patching (Machine) - Supply and Place"  
"Asphalt Stabilized Base Course Patching (Hand) - Supply and Place"  
"Proprietary Mix Patching (Machine) - Supply and Place" or  
"Proprietary Mix Patching (Hand) - Supply and Place"

Payments will be full compensation for preparing the surface, supplying and applying the prime or tack coat, supplying the asphalt binder, producing the crushed aggregate, producing, placing and compacting the asphalt pavement patching material, and all labour, material, equipment, tools, and incidentals necessary to complete the Work.

When an emergency patch is required and material is obtained from a Contractor Supply Source, payment will be made at the unit price bid per tonne for "Emergency Patch - Supply and Place". This payment will be full compensation for supplying, placing, and compacting the patching material, the accelerated scheduling required to complete the Work within 2 days, and all labour, equipment, tools and incidentals necessary to complete the Work.



Payment for the supply of aggregate for asphalt concrete pavement and asphalt stabilized base course mixes will be made in accordance with Specification 55.4, Supply of Aggregate.

No separate payment for supply of aggregate will be made for proprietary mixes.

#### 53.13.7.4 **Graduated Payment Scale**

For Work Orders which require:

- that only a single patch be constructed, and the actual quantity of material used to construct the patch is in excess of 25 tonnes or,
- that in excess of 100 tonnes of patching material is placed within a specified work area up to 3 km in length,

the applicable unit price bid for patching will be reduced by the amount bid per tonne for "Surface Patching Price Adjustment - Single Patch" or "Surface Patching Price Adjustment - 100 tonnes". These unit price adjustments will apply to the applicable quantity of material reported for payment (under the Work Order) with the exception that the price adjustment will not be applied for any material used for a patch classified as an "Emergency Patch" or a "Hand Patch". For example, if a Work Order requires a quantity of 90 tonnes of patching be performed with one of the patches (non-emergency, paver or machine) requiring 30 tonnes of material, the unit price adjustment for "Surface Patching Price Adjustment - Single Patch" will be applied to only 30 tonnes.

In situations where both price adjustments apply to the same Work Order, only the "Surface Patching Price Adjustment - 100 tonnes" will be used. For example, if a Work Order requires a total of 110 tonnes of patching material to be used within a 3 km work area and one of the patches requires 30 tonnes of material, only the price adjustment for "Surface Patching Price Adjustment - 100 tonnes" will apply, but it will apply to the entire 110 tonnes.

#### 53.13.7.5 **Premium Payments**

In urgent situations where the Contractor is required to complete Non-Emergency Patches within 10 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Surface Patching - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

In less urgent situations where the Contractor is required to complete non-emergency patches within 30 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Surface Patching - Interim Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

#### 53.13.8 WARRANTY

The warranty period for surface patches shall be 1 year, except for Emergency Patches which shall be 7 days.

## 53.14 ASPHALT PAVEMENT - DEEP PATCHING

### 53.14.1 GENERAL

The Work consists of the vertical cutting, excavation (generally not exceeding 750 mm in depth), and disposal of existing pavement, excavation and disposal of unsuitable base and sub-base material, and repair based on a typical structure of 100 mm of compacted asphalt pavement, 300 mm of compacted granular base course and 350 mm of compacted suitable subgrade fill. Painting of interim traffic markings (spotting) and the referencing of the ends of no passing zones (barrier lines) are included in the Work.

This specification is intended for patches which are typically less than 50m<sup>2</sup> in area. Repair of patches greater than 50m<sup>2</sup> will be done as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

### 53.14.2 MATERIALS

The Contractor shall either "pickup" asphalt pavement and granular base course patching material from a source/plant to which the Department has access, or shall supply the patching material, as directed by the Engineer.

Asphalt concrete patching material supplied by the Contractor shall be produced in accordance with specification 53.11 Production of Asphalt Concrete Pavement. Granular base course material supplied by the Contractor shall be provided in accordance with 53.3, Granular Base Course. The use of other materials will be subject to the approval of the Engineer.

Generally, the Contractor shall have the option of supplying any of the specified mix types or an approved alternative. However, the Engineer reserves the right to require the use of a particular specified mix type when, in his opinion, the materials being proposed by the Contractor are not suitable for the Work.

"Subgrade Fill" material supplied by the Contractor may be from sources of his own choice. The source(s) used shall be situated in the local vicinity of the Work unless otherwise approved by the Engineer. In cases where the existing "excavated" material is suitable, it may be used as subgrade fill. "Subgrade Fill" may be provided by the Department.

The Contractor shall supply prime and tack coat materials in accordance with Specification 55.5, Supply of Asphalt. The types and grades of liquid asphalts for prime and tack coats will be the choice of the Contractor, unless otherwise specified by the Engineer.

Paint and glass beads shall be supplied by the Contractor and shall comply with the requirements of the Alberta Transportation Products List. The Contractor may use self-adhesive, reflectorized pavement marking tape for interim pavement markings in lieu of paint and glass beads. Self-adhesive tapes shall also comply with the Alberta Transportation Products List.

### 53.14.3 PROCEDURES

The area to be repaired shall be marked out by the Engineer.

The Contractor shall vertically cut the designated area by using a method which does not disturb or damage the adjoining pavement. The unsuitable asphalt concrete pavement, base course, and subgrade material shall be excavated to the required depth and disposed of in a suitable manner. The depth of excavation required to provide an effective "deep patch" will vary based on site conditions and will be determined during the performance of the Work by the contractor with agreement by the Engineer. Generally, the depth required will not exceed 750 mm. Disposal of such material within the right-of-way

will be subject to the approval of the Engineer. In certain situations it may be necessary to exceed the design repair structure depth of 750 mm in order to achieve an effective patch. In these situations, the required depth will be agreed to by the Contractor and the Engineer.

"Daylighting" the patch to the sideslope of the highway to maintain subsurface drainage will be subject to the approval of the Engineer. This additional work shall be marked out by the Engineer and constructed with the standard deep patch repair structure.

Subgrade fill followed by granular base course shall be placed and compacted in the excavated area. Any loose debris or other excess material shall be removed from the finished surface of the granular base course. The exposed surface shall then be treated with a tack or prime coat. The tack coat shall extend a minimum distance of 150 mm beyond the edge of the repair area to allow for feathering of the patching material.

The asphalt concrete patching material shall be placed in uncompacted lifts not exceeding 80 mm in depth and compacted to produce a hard, stable surface which does not rut or otherwise distort under traffic loading. Patching material placed on the edges of a patch shall be feathered using rakes or lutes. Coarse material shall be removed from the edges of the patch.

Asphalt pavement material placed in a patch that is in a rutted depression in the direction of travel 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.

#### 53.14.3.1 **Interim Pavement Markings (Spotting)**

Where newly constructed patches obliterate existing painted roadway lines, the Contractor shall provide interim painted pavement markings (spotting) on the patched area immediately upon completion of the patching work. The end points of the barrier lines shall be marked or otherwise referenced where applicable.

When paint is used, it shall be of the same colour of paint as the permanent marking. Painted spots are to be 10 centimetres wide and 30 centimetres long, applied lengthwise to the road surface and shall delineate the travel lanes and/or edge lines as applicable. The maximum distance between spots shall be 15 metres on tangent sections and 7.5 metres on curves.

If using line paint and beads, the barrier line reference marks (on centreline) and lane spots shall be completely covered with glass beads at the time of painting.

#### 53.14.4 SAMPLING AND TESTING

The Contractor shall retain copies of his supplier's QC testing results, and undertake the quality control and quality assurance testing as required by the QC/QA Program as shown in the Special Provisions. The Contractor shall supply material samples to the Engineer for QA (Audit) testing purposes when requested.

#### 53.14.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, the patch shall be of the required structure thicknesses, provide a dense, smooth, and level transition between the treated area and the adjacent undisturbed pavement surface, and all debris and loose materials have been removed and properly disposed of.

#### 53.14.6 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 7 calendar days of the issuance of the Work Order. When the Work is required expeditiously but is not urgent, the Engineer will request the Work be completed within 30 calendar days. In all other cases, the Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 53.14.7 MEASUREMENT AND PAYMENT

##### 53.14.7.1 **General**

Measurement for asphalt pavement deep patching (up to 750 mm in depth), including any "daylighting" approved by the Engineer, will be in square metres of the surface area of the excavated hole/trench.

Measurement and payment for deep patches that require excavation greater than 750 mm in depth will be negotiated between the Engineer and the Contractor prior to commencing the Work.

Payment for hauling of new crushed aggregate and new asphalt concrete pavement from the closest source of acceptable material will be made in accordance with Specification 55.2, Hauling.

If a particular mix type is specified by the Engineer in the Work Order, and it is not readily available, the additional costs to the Contractor to supply that mix type will be paid as Extra Work.

Supplying and applying interim marking paint and glass beads will not be paid for separately but will be considered incidental to the Work.

Any damage caused to the roadway structure outside the patch area shall be repaired at the Contractor's expense.

##### 53.14.7.2 **Premium Payments**

In urgent situations where the Contractor is required to complete the Work within 7 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Deep Patching - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work, including accelerated scheduling for all related Work such as excavation and backfill, pit-run and granular base course.

In situations where the Contractor is required to complete the Work within 30 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Deep Patching - Interim Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work, including accelerated scheduling for all related Work such as excavation and backfill, pit-run, and granular base course.

##### 53.14.7.3 **Department Supply of Patching Materials**

Payment will be made at the unit price bid per square metre for "Asphalt Pavement - Deep Patching - Pick up and Place." This payment will be full compensation for cutting; excavating and disposing of materials; supplying, hauling, placing, and compacting suitable subgrade fill; picking up, placing, and compacting new granular base course material; supplying and applying prime or tack coat, picking up, placing, and compacting new asphalt concrete pavement material, interim traffic markings; and all labour, equipment, tools, and incidentals necessary to complete the Work.

#### 53.14.7.4 Contractor Supply of Patching Materials

Payment will be made at the unit price bid per square metre for "Asphalt Pavement - Deep Patching - Supply and Place." This payment will be full compensation for cutting; excavating and disposing of materials; supplying, hauling, placing, and compacting suitable subgrade fill; supplying, placing, and compacting new granular base course material; supplying and applying prime or tack coat, supplying, placing, and compacting new asphalt concrete pavement material, interim traffic markings; and all labour, equipment, tools, and incidentals necessary to complete the Work.

Payment for the supply of aggregate for asphalt concrete pavement and granular base course materials will be made in accordance with Specification 55.4, Supply of Aggregate.

#### 53.14.8 WARRANTY

The warranty period for this Work shall be 1 year.

**53.15 NOT USED**

## 53.16 SAW CUTTING OF ASPHALT CONCRETE PAVEMENT

### 53.16.1 GENERAL

The Work consists of vertical saw cutting of the existing asphalt pavement structure to facilitate the removal of the asphalt bound material.

### 53.16.2 EQUIPMENT

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

### 53.16.3 PROCEDURE

The Contractor shall saw cut the asphalt concrete pavement to a depth which will allow removal of the material without causing damage to the adjacent pavement. Rough, jagged, or cracked edges will not be acceptable.

### 53.16.4 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order and in conjunction with pavement patching operations.

### 53.16.5 MEASUREMENT AND PAYMENT

Payment will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work) except when it's performed as a component of Specification 53.14, Asphalt Pavement - Deep Patching, in which case it will be considered incidental to the Work.

### 53.16.6 WARRANTY

There is no warranty period for this Work.

## 53.17 ROADWAY AND RAISED MEDIAN CLEANING

### 53.17.1 GENERAL

The Work consists of removing soil and other debris from pavement surfaces and raised medians.

### 53.17.2 EQUIPMENT

When "pickup cleaning" is ordered, the Contractor shall supply a pickup broom equipped with a gutter broom on each side.

The Contractor has the option of using other equipment, such as bobcats, when necessary to scrape off compacted materials.

### 53.17.3 PROCEDURES

The debris shall be removed from the raised median and/or pavement surface. Debris shall not be deposited on roadway surfaces or sidewalks. Disposal of debris adjacent to the roadway shall be subject to the approval of the Engineer.

Cleaning operations shall be carried out in the same direction as the flow of traffic and in a manner which prevents material from being cast into the flow of traffic or into drainage inlets.

### 53.17.4 RESPONSE TIME AND TIME TO COMPLETE

In urgent situations, the Contractor shall respond within 2 hours of the issuance of the Work Order. In all other cases, the Contractor shall complete the Work within 30 calendar days of the issuance of the Work Order.

### 53.17.5 MEASUREMENT AND PAYMENT

Measurement will be in square metres of the raised median or roadway surface cleaned, regardless of the number of passes or level of effort required to complete the Work. When the width of the area to be cleaned is narrower than the broom used, the measurement will be based on the actual width of the broom (to a maximum value of 1.8 m) multiplied by the length of area cleaned. In all other cases, measurement will be made of the total area cleaned.

Payment will be made at the unit price bid per square metre for "Roadway Cleaning - Broom", "Roadway Cleaning - Pickup Broom", or "Raised Median Cleaning". Payment will be full compensation for removing and disposing of debris from the roadway surface and/or raised median and all labour, material, equipment, tools and incidentals necessary to complete the Work.

In urgent situations where the Contractor is required to respond within 2 hours of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Roadway Cleaning - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

### 53.17.6 WARRANTY

There is no warranty period for this Work.



**53.18 NOT USED**

**53.19 NOT USED**

## 53.20 PAINTED ROADWAY LINES

### 53.20.1 GENERAL

The Work consists of supplying paint and painting roadway lines on pavement surfaces. The various configurations of roadway lines are shown in the latest edition of the Department manual entitled *Alberta Transportation Highway Pavement Marking Guide*.

### 53.20.2 MATERIALS

#### 53.20.2.1 **Paint and Glass Beads**

The Contractor shall supply the paint and glass bead materials from the *Alberta Transportation Products List*. The Contractor shall be responsible for ensuring that the quality of the paint and beads supplied meets the requirements specified.

The Contractor shall provide the Engineer with the following information prior to commencing the Work:

- Names and mailing addresses of the suppliers and manufacturers.
- Paint formulation to be supplied.
- Written confirmation from the manufacturer that the materials to be supplied meet all specified requirements.

In accordance with Environment Canada's *Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations*, traffic marking coating in which the VOC concentration exceeds 450 grams per litre is not allowed after September 9, 2010. In accordance with the same document, starting September 9, 2012, during the period beginning on May 1 and ending on October 15, any traffic marking coating in which the VOC concentration exceeds 150 grams per litre is not allowed.

The Contractor shall advise the Engineer of any change in paint formulation.

The Contractor shall verify that all materials delivered and used in the Work are the type ordered.

No paint formulation shall be diluted or mixed with a different formulation or with any other material without the prior approval of the Engineer.

The Contractor shall prevent contamination of the materials. Paint shall be protected from freezing.

### 53.20.3 EQUIPMENT

The Contractor shall supply all equipment necessary to complete the Work.

#### 53.20.3.1 **Painting Truck**

The painting truck shall be self-propelled and equipped to meet or exceed the following requirements:

- Two paint tanks each having a minimum capacity of 270 litres feeding three lines for a simultaneous two-colour application (two yellow directional dividing lines and one white edgeline).
- Painting controls capable of adjusting the paint application for the length of dashed line required. Each spray gun shall have independent controls and adjustment mechanisms and shall be operated from the operator's compartment.

- The compressors shall have a minimum rated capacity of 4.25 cubic metres per minute.
- Bead dispensers shall be electrically controlled, air operated, and gravity fed with controls to adjust the bead flow. The bead dispensers shall be fed from tanks capable of holding a minimum of 45 kilograms of beads.
- A television vehicle guidance or a vehicle guidance system mounted on a retractable A-frame with a guide wheel and pointer system, to assist the operator in maintaining alignment on the existing lines.
- A minimum of five spray guns and bead dispensers mounted in the following configuration:
  - Three spray guns and three bead dispensers mounted on an independently-controlled boom located on the left side of the truck to paint the directional dividing lines. The outer two spray guns and bead dispensers shall be in a configuration that will produce two lines of equal width with the distance between the two lines equal to the width of one line (100 mm). The inner spray gun and bead dispenser shall operate independently and shall be used to apply the directional dividing line where only a single directional dividing line is required. When a 200 mm wide line is required, 2 adjacent guns shall be used simultaneously.
  - Two spray guns and two bead dispensers mounted on an independently controlled boom on the right side of the truck to apply the right edge line. When a 200 mm wide line is required 2 adjacent guns shall be used simultaneously.
- Equipped to apply white or yellow paint from the three spray guns mounted on the left hand side of the paint truck and to switch from one colour to the other during operation.
- Control of both independent booms, all spray guns, bead dispensers, and painting controls from the operator's compartment(s).

The Engineer may allow the use of alternate equipment, provided the Contractor demonstrates that such equipment is capable of achieving the desired end product.

#### 53.20.3.2 Companion Vehicles

As stated in Specification 51.3.5, the painting vehicle shall be immediately followed by a crash attenuator vehicle consisting of a five ton truck equipped with a crash attenuator which meets National Cooperative Highway Research Program, Report 350 Test Criteria, Test Level 3 for 100 km/hour work zones. The weight of the crash attenuator vehicle including ballast, flashing arrow board, and truck mounted crash attenuator shall be 6 300 to 12 000 kg.

The crash attenuator vehicle shall be followed by a ½ ton or larger truck acting as a pilot vehicle.

#### 53.20.3.3 Safety Equipment

The painting truck and both companion vehicles shall be equipped with the following:

- A two-way radio for voice communication.
- An overhead revolving beacon with an amber lens a minimum of 180 mm high and 180 mm wide. The beacon shall be mounted on the top of the vehicle fully visible to traffic approaching from both front and rear.

- A sequential arrow board meeting the requirements of Specification 53.38.
- A "slow moving vehicle" sign. The sign shall be mounted at the rear of the vehicle and be visible to the public only when the painting truck is applying paint.
- A warning sign, mounted at the rear of the equipment, stating "wet paint keep off". The sign shall have standard warning colours with letters having a minimum height of 150 mm and shall be visible to the public only when the equipment is applying paint.

#### 53.20.4 PROCEDURE

##### 53.20.4.1 **General**

Operation of the painting truck against the flow of traffic is not permitted.

Materials loading is not permitted on the travel lanes of a roadway surface.

##### 53.20.4.2 **Operation of Companion Vehicles**

The Contractor shall operate both companion vehicles in conjunction with the painting truck during the painting of all longitudinal lines. Companion vehicle operators shall not attempt to control traffic from inside the vehicle.

The actual operating parameters of the companion vehicles will be determined by the Contractor to safely accommodate traffic and will be based on site specific conditions such as sight distances, highway geometrics, and traffic patterns and volumes. Typical operating parameters are as follows:

###### 53.20.4.2.1 Crash Attenuator Vehicle

The crash attenuator vehicle shall follow behind the painting truck at a distance of 50 to 400 metres. Typically, on 4 Lane highways the crash attenuator vehicle should closely follow the paint truck to encourage traffic to maintain the passing lane and not pull in behind the paint vehicle. On 2 Lane roadways, traffic should still be encouraged to pass both vehicles in one pass, however actual conditions may dictate that the crash attenuator vehicle give way to allow safe passing.

On Single Lane Roads (for example on interchange ramps) the crash attenuator vehicle shall be driven in the travel lane to keep traffic from passing the painting truck.

###### 53.20.4.2.2 Pilot Vehicle

On 2 Lane and 4 Lane Highways the pilot vehicle shall be operated as follows:

- (i) On a 4 Lane Highway, the pilot truck shall be driven in the same travel lane as the painting truck, following it at a constant distance of approximately two kilometres.
- (ii) On a 2 Lane Highway with a minimum 3 metre shoulder, the pilot truck shall be driven along the right shoulder, not straddling the right edge line, and following the painting truck at a constant distance of approximately two kilometres.
- (iii) On a 2 Lane Highway with less than a 3 metre shoulder, the pilot truck shall travel from approach road to approach road and stop until the paint machine has cleared the next approach road. Approach road in this context includes local roads, farm entrances, field entrances, etc. The pilot

truck, when stopped in an approach road, shall sit parallel to the highway in order that the signs and arrowboard are fully visible to traffic approaching from the rear.

#### 53.20.4.3 Arrowboard Message

The crash attenuator vehicle, pilot truck, and the painting truck shall display the same message at all times. The message shall be one of the following:

- On 2 Lane Highway - a bar (6 horizontal lights flashing) is preferred, but if a bar cannot be shown on the type of arrowboard used, the 4 corner lights flashing is an acceptable alternative.
- On a 4 Lane Highway - a right arrow when operating in the left lane and a left arrow when operating in the right lane.
- On a Single Lane Road (for example the exit leg of an interchange) - four flashing corner lights or a bar.

#### 53.20.4.4 Areas to be Painted

The Contractor shall paint lane lines, continuity lines, edge lines, and directional dividing lines on the highway sections, interchanges, or intersections specified, as well as the lines through towns, at truck turnouts, rest areas, points of interest, and weigh scale turnouts. At intersections of provincial highways and local roads, the Contractor shall paint the shoulder lines on the provincial highway to a point corresponding to the edge of the right of way, or as directed by the Engineer.

The Contractor shall ensure that painted lines match the existing lines exactly unless otherwise directed by the Engineer. When painting is required in areas where there are no existing lines or where revisions to the existing lines are required, these areas will be identified and laid out or spotted by the Engineer.

#### 53.20.4.5 Pavement Surface and Atmospheric Conditions

In addition to the general restrictions specified in Specification 51.2, General (For Maintenance Work), painting shall not be performed during the following conditions:

- When the temperature is outside of the manufacturer's specifications
- When wind conditions cause overspray.
- During periods of rainfall.

Areas to be painted shall be inspected by the Contractor to ensure they are dry, clean, free of sand and debris, and suitable for painting.

The Contractor shall immediately notify the Engineer of any areas that in his opinion are unsuitable for painting. Sweeping, when directed by the Engineer, shall be performed by the Contractor.

#### 53.20.4.6 Paint and Bead Application

The Engineer will specify the application rate to be used for each section of highway. Paint shall be uniformly applied. Except for "wide lines" as designated, all painted lines shall be 100 mm wide. Glass beads shall be applied immediately following the paint application at a uniform application rate of 600 g/ℓ of paint.

#### 53.20.4.7 **Removal of Incorrectly Painted Lines**

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

#### 53.20.5 SAMPLING AND TESTING

The Contractor shall satisfy himself that the material meets the required quality, with a minimum requirement as stated in the QC/QA process shown in the Special Provisions. The Contractor shall provide the Engineer with the quality control records for review upon request.

All materials will be subject to further inspection, sampling, and testing by the Department and the Contractor shall provide safe, convenient access, acceptable to the Engineer, for inspection and sampling of the materials, and shall cooperate in the inspection and sampling process when requested to do so.

#### 53.20.6 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 7 calendar days of the issuance of the Work Order. In all other cases, the Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 53.20.7 ACCEPTANCE CRITERIA

The Work will be considered acceptable under the following conditions:

- When the following dimensional criteria are met:
  - Painted lines do not exceed a dimensional width of 110 mm for specified 100 mm wide line. No tolerance below 100 mm is allowed for the specified 100 mm wide line.
  - Painted lines do not exceed a dimensional width of 210 mm for specified 200 mm wide line. No tolerance below 200 mm is allowed for the specified 200 mm wide line.
  - Painted direction dividing, lane dividing, or continuity lines do not exceed a maximum dimensional length deviation of +/- 100 mm for specified 3.0 m length of line.
  - No spaces between painted direction dividing, lane dividing, or continuity lines exceed a maximum dimensional length deviation of +/- 100 mm for specified 6.0 m or 3.0 m length of space.
- All painted lines are uniform in thickness and free of excess tire tracking, with no splatter, excessive overspray, or other defects.
- All paint and glass beads have been applied at the proper locations and in accordance with the drawings.
- Any incorrectly painted lines or lines painted at improper locations have been removed to the satisfaction of the Engineer.
- The "Actual Daily Amount" of each colour of paint applied each day is at least 95% of the applicable "Required Daily Amount".
  - The "Required Daily Amount" for each day will be determined using the applicable specified paint application rate and the length of each colour of line painted. The "Actual Daily Amount" applied each day will be determined by measuring the number of loads or partial loads for each colour of paint.

- Glass beads have been uniformly applied at the specified application rate.

## 53.20.8 MEASUREMENT AND PAYMENT

### 53.20.8.1 **Painting Roadway Lines**

#### 53.20.8.1.1 General

Measurement will be made in kilometres of the length of line painted. Separate measurements will be made for each colour of paint used. The spaces between “dashed lines” are not included in the measurement for payment.

No payment will be made for any roadway lines painted during a given day in which the Acceptance Criteria has not been achieved for that day.

#### 53.20.8.1.2 Painting Roadway Lines - Multiple Lines Ordered

Payment will be made at the applicable unit price bid per line-kilometre for the Bid Items below, regardless of the specified width. These payments will be full compensation for inspecting the areas to be painted, applying the paint and glass beads and all companion vehicles, labour, equipment, tools, and incidentals necessary to complete the Work.

- Painted Roadway Lines – White
- Painted Roadway Lines - White (Low Temperature)
- Painted Roadway Lines – Yellow
- Painted Roadway Lines - Yellow (Low Temperature)

#### 53.20.8.1.3 Painting Roadway Lines - Single Lines Ordered

This bid item shall only apply when line painting is performed on segments of highway where the Department has required that only a single line be painted. The bid item shall not apply to "single lines" painted on intersections, interchanges, acceleration or deceleration lanes, or on sections of highway where more than 2 lines are being painted as part of the painting operation at that time.

Payment will be made at the applicable unit price bid per line-kilometre for the Bid Items below, regardless of the specified width. These payments will be full compensation for inspecting the areas to be painted, applying the paint and glass beads and all companion vehicles, labour, equipment, tools, and incidentals necessary to complete the Work.

- Painted Roadway Lines – White – Single Line Ordered
- Painted Roadway Lines - White (Low Temperature) – Single Line Ordered
- Painted Roadway Lines – Yellow – Single Line Ordered Painted
- Roadway Lines - Yellow (Low Temperature) – Single Line Ordered

#### 53.20.8.1.4 Premium Payments

In urgent situations where the Contractor is required to complete the Work within 7 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Line Painting - Premium". This item will apply regardless of the type of paint used and payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

### 53.20.8.2 **Painting Roadway Lines at Intersections and Interchanges**

Separate measurements will be made of the number of intersections (per side of road) and the number of interchanges painted.

Payment will be made at the unit price bid per side for "Line Painting – Intersections" or at the unit price bid per interchange for "Line Painting – Interchanges". These payments will be full compensation for the additional effort involved in painting roadway lines at these locations. These payments will be separate and additional to those made for "Painted Roadway Lines".

Payment for "Line Painting - Intersections" will only be made for those intersections where the Contractor is required to paint additional lane lines (turning lanes or acceleration/deceleration lanes) and will be based on the number of roadway sides of the intersection requiring line painting. See Maintenance Bulletin 10 – Intersection Sides.

Payment for "Line Painting - Intersections" will also be made for the painting of climbing lanes or passing lanes.

The unit price bid for "Line Painting - Interchanges" will apply regardless of the size of the interchange.

These items will apply regardless of the type of paint used.

### 53.20.8.3 **Supply of Paint and Glass Beads**

Measurement will be made in litres of the daily quantity of paint used, up to maximum of 103% of the "Required Daily Amount". Separate measurements will be made for each colour and type of paint. The quantities will be determined by measuring the number of loads or partial loads of paint used each day.

Payment will be made at the applicable unit price bid per litre for "Supply of Paint - Yellow", "Supply of Paint – Yellow (Low Temperature)", "Supply of Paint - White" or "Supply of Paint –White (Low Temperature)". These payments will be full compensation for supplying, storing, and handling the paint and all labour, equipment tools and incidentals necessary to complete the Work.

No payment will be made for any quantities of paint used in excess of 103% of the "Required Daily Amount".

No payment will be made for any quantities of paint used when the lines fail to meet the Acceptance Criteria.

The supply and application of glass beads is considered incidental to the work and no separate payment will be made.

Ensure the appropriate glass beads are used for the type of paint applied.

### 53.20.8.4 **Sweeping**

Measurement and payment for sweeping will be made in accordance with Specification 53.17, Roadway and Raised Median Cleaning, as required.

### 53.20.9 WARRANTY

The warranty period for this Work shall be 60 days.



## 53.21 PAINTED PAVEMENT MARKINGS

### 53.21.1 GENERAL

The Work consists of supplying paint and glass beads and painting markings on pavement surfaces.

### 53.21.2 MATERIALS

#### 53.21.2.1 **Paint and Glass Beads**

The Contractor shall supply the paint and glass bead materials from the Alberta Transportation Products List. The use of other products will be subject to the approval of the Engineer. The Contractor shall be responsible for ensuring that the quality of the paint and beads supplied meets the requirements specified.

No paint formulation shall be diluted or mixed with a different formulation or with any other material without the specific approval of the Engineer.

The Contractor shall take all necessary steps to prevent contamination of the materials. Paint shall be protected from freezing.

When requested by the Engineer, the Contractor shall provide the following information:

- Names and mailing addresses of the suppliers and manufacturers.
- Paint formulation to be supplied.
- Written conformation from the manufacturer that the materials to be supplied meet all specified requirements.

### 53.21.3 PROCEDURE

#### 53.21.3.1 **Pavement Marking Dimensions**

Painting shall be performed using a template or other method that will achieve the dimensions shown in the applicable drawings contained in the latest edition of the *Alberta Transportation Highway Pavement Marking Guide*.

#### 53.21.3.2 **Pavement Surface and Atmospheric Conditions**

In addition to the general restrictions specified in Specification 51.2, General (For Maintenance Work), painting shall not be performed during the following conditions:

- When the temperature is outside of the manufacturer's specifications
- When wind conditions cause over spray.
- During periods of rainfall.

Areas to be painted shall be inspected by the Contractor to ensure they are dry, clean, free of sand and debris, and suitable for painting.

#### 53.21.3.3 **Paint and Bead Application**

All painted messages shall be uniform in thickness with no splatter, excessive overspray, or other defects. To produce a uniform appearance of colour and reflectivity, paint and glass beads must be uniformly applied such that the beads do not contact the pavement surface. Typically, this can be achieved using an application rate of about 0.4 ℓ/m<sup>2</sup> for the paint and 600 grams of glass beads per litre of paint.

Traffic shall be kept off painted messages until the paint has dried and will not track under traffic.

The Contractor shall be responsible for the proper clean up of waste or spilled material and the proper disposal of containers and waste.

#### 53.21.4 SAMPLING AND TESTING

The Contractor shall satisfy himself that the material meets the required quality. The Contractor shall provide the Engineer with the quality control records for review upon request.

All materials may be subject to further inspection, sampling, and testing by the Department and the Contractor shall provide safe, convenient access, acceptable to the Engineer for inspection and sampling of the materials, and shall cooperate in the inspection and sampling process when requested to do so.

#### 53.21.5 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 7 calendar days of the issuance of the Work Order. In all other cases, the Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 53.21.6 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, markings shall be correctly applied regarding application rates, location, colour, size, alignment (within 5 cm of desired location, as measured from the painted centreline), shall not have "tracked" under traffic, and shall have a uniform appearance for colour and reflectivity.

Markings applied at incorrect locations shall be completely removed at the Contractor's expense. The method used to remove an incorrect marking shall be subject to the approval of the Engineer.

#### 53.21.7 MEASUREMENT AND PAYMENT

Measurement will be in square metres (to the nearest tenth of a square metre) of the painted area for each marking.

Payment will be made at the unit price bid per square metre for "Painting Pavement Markings". This payment will be full compensation for inspecting the areas to be painted, cleaning the pavement surface when required, supplying templates if necessary, supplying and applying the paint and glass beads, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

Ensure the appropriate glass beads are used for the type of paint applied.

In urgent situations where the Contractor is required to complete the Work within 7 calendar days of the issuance of the Work Order, an additional payment per Work Order will be made at the unit price bid per occurrence for "Painting Pavement Markings - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

#### 53.21.8 WARRANTY

The warranty period for this Work shall be 60 days with the exception of Stop Bars which will be 30 days.

## 53.22 DURABLE PAVEMENT MARKINGS

### 53.22.1 GENERAL

The Work consists of supplying and applying various durable pavement markings.

### 53.22.2 MATERIALS

The Contractor shall supply materials from the Alberta Transportation Products list. The use of other materials will be subject to the approval by the Engineer.

### 53.22.3 PROCEDURE

Dimensions of pavement markings shall comply with the applicable drawings contained in the latest edition of the *Alberta Transportation Highway Pavement Marking Guide*.

The Contractor shall conform to the manufacturer's recommended procedures, or the best industry standard, for material handling, storage, installation, and disposal. The Contractor shall provide a copy of the manufacturer's recommended procedures to the Engineer prior to commencing the Work.

When durable markings are required in areas where there are no existing messages or where revisions to the existing messages are required, the positioning of the pavement messages will be determined by the Engineer.

The Contractor shall inspect the work area and perform any sweeping or cleaning of the pavement surface which is required.

The Contractor shall leave the work area in a clean condition after installation of the marking.

### 53.22.4 TIME TO COMPLETE

The Contractor shall complete the Work within 90 days of the issuance of the Work Order.

### 53.22.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, markings must be correctly applied regarding location, colour, size, alignment (within 5 cm of desired location, as measured from the painted centreline), and have a uniform appearance for colour and reflectivity.

To be acceptable during the warranty period the markings shall:

- not lift from the pavement,
- exhibit no material loss within 4 weeks of installation,
- not deteriorate by contact with ice control materials or traffic residue,
- show no appreciable deformation or discolouration under exposure to traffic and road temperatures between -40°C and 40°C and,
- maintain their original dimension and placement without chipping or cracking.

### 53.22.6 MEASUREMENT AND PAYMENT

Measurement will be in square metres (to the nearest tenth of a square metre) of the area of the markings applied.

Payment will be made at the unit price bid per square metre for "Durable Pavement Marking, Tape-Supply and Install", or the unit price bid per square metre for "Durable Pavement Marking, Thermoplastic - Supply and Install". These payments will be full compensation for inspecting the work areas, cleaning the pavement surface when necessary, supplying and applying the durable marking material, cleaning the work site after installation, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

If the Engineer directs the Contractor to remove the existing message before painting the new message, removing the existing message shall be paid through Extra Work.

#### 53.22.7 WARRANTY

The warranty period for this Work shall be 2 years, with the exception that the warranty period for Stop Bars will only be 1 year.

53.23 NOT USED

## 53.24 RAISED PAVEMENT MARKERS

### 53.24.1 GENERAL

The Work consists of supplying and installing raised pavement markers, and replacing reflectors in previously installed markers.

### 53.24.2 MATERIALS

The Contractor shall supply all materials from the Alberta Transportation Products list. The colour of the reflectors will be determined by the Engineer.

### 53.24.3 PROCEDURE

Markers shall be installed, and reflectors replaced, in accordance with the manufacturer's recommended installation procedures. The Contractor shall provide a copy of these procedures to the Engineer prior to commencing the Work.

Markers shall be installed at the locations and intervals as designated in the Work Order. For skip line installations, the markers shall be centred in the space between the lines.

### 53.24.4 TIME TO COMPLETE

The Contractor shall complete the Work within 60 days of the issuance of the Work Order.

### 53.24.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable:

- the marker base must be installed flush with the pavement surface,
- the reflector must be unbroken and clearly visible to traffic,
- the markers must be installed at the correct interval, parallel to centreline, and are at the correct alignment, and,
- the entire installation is installed in accordance with the manufacturer's recommended procedures.

### 53.24.6 MEASUREMENT AND PAYMENT

Payment for the work will be made as Extra Work in accordance with Specification 51.2 – General Specifications (for Maintenance Work) and as shown on the Work Order.

### 53.24.7 WARRANTY

The warranty period for an installed pavement marker is 1 year. The warranty period for a replacement reflector is 30 days.

53.25 NOT USED

53.26 NOT USED

## **53.27 MAINTENANCE AND PREPARATION (GRADING) OF GRAVEL SURFACE ROADS AND SNOW REMOVAL AND ICE CONTROL ON GRAVEL AND PAVED SURFACES**

### 53.27.1 GENERAL

The Work consists of using a grader to maintain gravel surface roads during the summer months, to prepare gravel roads prior to gravel surfacing, and/or dust abatement (including oiling roads), and to perform snow removal and ice control on gravel surfaced roads and paved surfaces during the winter months.

The road preparation work consists of preparation of the roadway and retrieving existing gravel, not rebuilding the roadway. Any major realigning or width changes will be undertaken as a separate activity.

### 53.27.2 MATERIALS

In normal circumstances, no materials are required for this Work. The Contractor may be required to provide gravel for summer work. If gravel is required, it shall be supplied in accordance with Specification 53.29, "Spot Graveling", or Specification 53.30, "Gravel Surfacing".

### 53.27.3 EQUIPMENT

The Contractor shall supply a motor grader in good working condition and meeting the following requirements:

- possesses a 150 horsepower engine or greater,
- is less than 12 years old, or as outlined in the Special Provisions. For smaller sections of gravelled roads, an older grader may be used if approved by the Engineer,
- is equipped with functioning headlights, tail lights, moldboard lights, backup lights, 4-way flashers, back up alarm, revolving light, slow moving symbol, and warning flags on the outward edges of the cab and moldboard,
- is equipped with a functioning hour metre,
- is equipped with an adequate set of blades, scarifier teeth, and shanks; and Sandvik® blades (with System 2000 bits) or equivalent,
- is equipped with a wing mounted on the right hand side for winter operations; the Special Provisions will specify the time period in which wings must be supplied,
- properly fitting tire chains available at the worksite, when required or necessary,
- a left side wing when specified in the Special Provisions

The Special Provisions outlines the number and general locations of motor graders required to be equipped with a Global Positioning System (GPS). The data can be submitted to the Department in the following formats: Microsoft Excel, Microsoft Access, or .CSV files. The files shall provide time, speed of the unit, position in latitude and longitude, and corresponding highway, control section, and kilometre point for each latitude and longitude position. Billable and non-billable times do not have to be identified. Blade up/down information is not required. The information shall be provided at one data point every 5 minutes. The information shall be provided to the Department on a weekly basis, or as requested by the Engineer.

The Contractor must maintain an archive of each motor grader's GPS positioning and activity files for a minimum of one year, and make copies of these archives available to the Engineer on request.



The Engineer reserves the right to inspect the equipment prior to commencement of the Work and at any time during the term of the Contract to ensure the equipment meets all requirements. Equipment downgrades will not be accepted unless specifically authorized by the Engineer.

#### 53.27.4 PROCEDURES

##### 53.27.4.1 **General**

For all work covered by this specification, graders shall travel in the same direction as the traffic at all times; unless traffic is controlled according to an approved Traffic Accommodation Strategy.

Material used or resulting from the performance of this work shall not be carried onto structures such as bridge decks, cattle guards, paved surfaces, and railway crossings. Should this occur, the Contractor shall remove the material from the structures at his expense. Backblading may be required to remove excess material from the edges of such structures. The Contractor shall ensure there is a smooth transition on and off of the structures.

After crossing railway tracks, bridge structures, and cattle guards, the Contractor shall immediately inspect the flangeways of the railway track and the other structures for any damage and, in the event any damage is evident, the Contractor shall immediately inform the railway company roadmaster for railway damage and the Engineer for damage to all structures.

##### 53.27.4.2 **Summer Maintenance of Gravel Roadways**

The roadway shall be bladed to eliminate pot holes, washboards, and ruts. The crown on tangents shall be retained or restored and the superelevation on curves shall be retained or restored over the entire roadway width.

At intersections, the crown on the main roadway shall be maintained through the intersection. The crown on the intersecting roadway shall be feathered back.

Whenever possible, windrowed material shall not be left on the roadway overnight. If windrowed material must be left on the roadway overnight, it must be signed and barricaded to maintain safety, as per TCS-B-1.5(a) in the Department's Traffic Accommodation in Work Zones manual.

The Contractor shall make every effort to minimize the loss of gravel from the roadway surface when performing the Work.

When required by the Engineer, the Contractor shall supply and erect the following signs when performing Summer Maintenance as per TCS-B-2.6(a) in the Traffic Accommodation in Work Zones manual.

<b>TEMPORARY SIGNS FOR SUMMER MAINTENANCE</b>					
Sign No.	Message or Description	Size (Centimetre)	Shape	Colour	
				Message	Background
WD-191	Road Grading 3km	75 x 75	Diamond	Black	Orange
WD-193	Grading Next 3km	120 x 120	Diamond	Black	Orange
WD-150	Loose Gravel	75 x 75 or 90 x 90	Diamond	Black	Orange
WD-151	Windrow	75 x 75 or 90 x 90	Diamond	Black	Orange

Sign sizes, shapes, symbols, and colours are to be in accordance with the latest edition of the Traffic Accommodation in Work Zones manual.

#### 53.27.4.3 Preparation of Gravel Roadways

Gravel roadways shall be prepared such that the finished surface has defined shoulders, proper crown, and proper superelevation on curves. Loose gravel shall be retrieved from the roadway sideslopes and spread over the roadway in a manner that provides a finished surface which is smooth and free of any large rock and other objectionable material including grass clumps and sods.

When it is determined by the Engineer and the Contractor that an arrowboard is required in order to safely perform this activity, the Contractor shall supply a mobile truck mounted arrowboard in accordance with Specification 53.38, Supply of Arrowboards and Dynamic Message Signs for Traffic Control.

#### 53.27.4.4 Winter Maintenance

##### 53.27.4.4.1 Gravel Surface Roadways

Snow shall be removed from the roadway surface and winging of sideslopes as directed by the Engineer. When necessary, ice shall be scarified or removed from the roadway surface.

When maintaining roadways in winter, high snow banks which limit visibility of traffic shall be removed from areas near railway tracks, intersections, signs, or other points designated by the Engineer.

When it is determined by the Engineer and the Contractor that an arrowboard is required in order to safely perform this activity, the Contractor shall supply a mobile truck mounted arrowboard in accordance with Specification 53.38, Supply of Arrowboards and Dynamic Message Signs for Traffic Control.

##### 53.27.4.4.2 Paved Surface Roadways

Snow shall be removed from the roadway surface and winging of sideslopes as directed by the Engineer. When necessary, ice shall be scarified or removed from the roadway surface.

When maintaining roadways in winter, high snow banks which limit visibility of traffic shall be removed from areas near railway tracks, intersections, signs, or other points designated by the Engineer.

When it is determined by the Engineer and the Contractor that an arrowboard is required in order to safely perform this activity, the Contractor shall supply a mobile truck mounted arrowboard in accordance with Specification 53.38, Supply of Arrowboards and Dynamic Message Signs for Traffic Control.

### 53.27.5 ACCEPTANCE CRITERIA

Winter and summer maintenance shall be performed to the satisfaction of the Engineer. Preparation of gravel roadways will be evaluated through visual inspection by the Engineer and shall comply with the following:

- The roadway surface is smooth and free of ridges, rocks, and other material that may be hazardous to traffic.
- All pot holes, washboards, ruts, and grass clumps have been eliminated.
- Roadway shoulders are well defined.
- At intersections, the crown on the main roadway has been maintained through the intersection while the crown on the intersecting roadway has been feathered back.
- The finished surface has a uniform crown of between 3% and 5%.
- Superelevation on curves is retained or restored.
- Existing gravel material has been retrieved from the sideslopes as required.

### 53.27.6 RESPONSE TIME AND TIME TO COMPLETE

#### 53.27.6.1 **Summer and Winter Maintenance**

The storage location and time to complete the Work will be determined by the Engineer in consultation with the Contractor.

The Contractor shall schedule his operations based on priority routes as identified by the Engineer.

For winter work, as requested by the Engineer, the Contractor shall mobilize blading equipment within 6 hours of the request.

#### 53.27.6.2 **Preparation of Gravel Surface Roadways**

The Contractor shall complete the Work within 30 days of the issuance of the Work Order. This Work is usually performed in conjunction with gravel surfacing or dust abatement activities.

### 53.27.7 MEASUREMENT AND PAYMENT

#### 53.27.7.1 **Measurement**

Measurement will be in hours (to the nearest 1/4 hour) for the time the grader is engaged in the Work in accordance with the following:

- two 15 minute coffee breaks per day will be allowed (no deduction)
- travel time between worksites will be paid for up to a maximum of one hour per day, unless otherwise agreed to by the Engineer and Contractor.

Payment will not be made for travel time from the storage location of the grader to and from the worksite, nor for time required to change blades, refuel or install chains.

#### 53.27.7.2 **Payment**

Payment will be made at the unit price per hour for "Motor Grader Work on Gravel Surface Roads" and "Snow Removal and Ice Control on Paved Surfaces (Grader)", as applicable.

Payment for Motor Grader Work on Gravel Surface Roads will be full compensation for both summer and winter maintenance work on gravel surface roads including supplying the grader complete with blades and all specified attachments, maintaining or preparing the roadway, removing snow and/or ice from the roadway and/or sideslopes, signing and all labour, equipment, tools, and incidentals necessary to complete the Work.

Payment for Snow Removal and Ice Control on Paved Surfaces (Grader) will be full compensation for supplying the grader complete with blades and all specified attachments, removing snow and/or ice from paved roadways and/or slopes, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Costs associated with supplying the GPS equipment and providing the data to the Department is incidental to the Work.

If the Engineer and the Contractor agree that extra equipment, such as a water truck or gravel retriever, is required to complete the Work, payment for such equipment will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

If an arrowboard is required, payment will be made in accordance with Specification 53.38, Supply of Arrowboards and Dynamic Message Signs for Traffic Control.

If the Engineer requests the graders to mobilize within 6 hours in winter, a premium will be paid per occurrence for “Winter Mobilization of Graders – Premium”.

#### 53.27.8 WARRANTY

There is no warranty period for this Work.

**53.28 NOT USED**

## 53.29 SPOT GRAVELLING

### 53.29.1 GENERAL

The Work consists of placing and spreading crushed gravel on roadways and approaches and other low volume work, generally in individual areas where 30 cubic metres or less would be applied (equivalent to 50 tonnes or about 1000 square metres).

### 53.29.2 MATERIALS

The Contractor shall either pick up crushed gravel from a source designated by the Engineer or supply crushed gravel of the specified designation and class in accordance with Specification 55.3, Aggregate Production and Stockpiling and Specification 55.4, Supply of Aggregate.

When the Contractor supplies the crushed gravel, the location of the source must be suitable to both the Department and the Contractor and will be agreed upon prior to the commencement of the Work.

### 53.29.3 PROCEDURES

Equipment used for spreading gravel shall operate in the direction of normal traffic flow at all times.

The gravel shall be placed in one or more layers as designated by the Engineer. The application rate for each layer will be as shown in the Work Order or as designated by the Engineer.

Following unloading, gravel shall be promptly and uniformly spread.

There shall be no residual gravel remaining in the truck boxes after unloading.

The application rate for each layer shall be as shown in the Work Order or as designated by the Engineer.

Gravel shall be windrowed prior to final spreading. Gravel shall be promptly and uniformly spread before darkness each day. In unanticipated situations where gravel windrows must be left overnight, the contractor is responsible for traffic control in the work zone, to the satisfaction of the Engineer.

### 53.29.4 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, gravel must be spread smoothly and uniformly over the area being treated.

### 53.29.5 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 2 days of the issuance of the Work Order. In all other cases, the Contractor shall complete the Work within 10 days of the issuance of the Work Order.

### 53.29.6 MEASUREMENT AND PAYMENT

#### 53.29.6.1 **General**

Measurement will be in cubic metres of crushed gravel placed.

The capacity of the gravel hauling vehicles will be determined by the Engineer. The measurements will be to the nearest 0.1 m<sup>3</sup> capacity, and the capacity of the vehicle, once measured, shall not be changed without the consent of the Engineer.

In urgent situations where the Contractor is required to complete the Work within 2 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Spot Gravelling - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

There will be no separate or additional payment when gravel surfacing is placed in more than one layer.

Payment for hauling will be made in accordance with Specification 55.2, Hauling.

When extremely low volume work (less than 7m<sup>3</sup> aggregate) on approaches or other small areas is required by the Engineer, payment will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

#### 53.29.6.2 Contractor Supply of Crushed Gravel

Payment will be made at the unit price bid per cubic metre for "Spot Gravelling - Supply and Place". This payment will be full compensation for supplying and spreading gravel surfacing material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Payment for the supply of aggregate will be made in accordance with Specification 55.4, Supply of Aggregate.

#### 53.29.6.3 Department Supply of Crushed Gravel

Payment will be made at the unit price bid per cubic metre for "Spot Gravelling - Pick up and Place". This payment will be full compensation for picking up and spreading gravel surfacing material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

#### 53.29.7 WARRANTY

There is no warranty period for this Work.

## 53.30 GRAVEL SURFACING

### 53.30.1 GENERAL

The Work consists of placing and spreading crushed gravel on specified roadways as designated by the Engineer. The area to be graveled will usually require a volume larger than 50 tonnes (covering more than 1000 square metres).

If approaches or other small sites within the area being graveled are done at the same time gravel surfacing is done, it is paid as Gravel Surfacing.

### 53.30.2 MATERIALS

The Contractor shall either pick up crushed gravel from a source designated by the Engineer or supply crushed gravel of the specified designation and class in accordance with Specification 55.3, Aggregate Production and Stockpiling and Specification 55.4, Supply of Aggregate.

When the Contractor supplies the crushed gravel, the location of the source must be suitable to both the Department and the Contractor and will be agreed upon prior to the commencement of the Work.

### 53.30.3 PROCEDURES

The application rate for each layer shall be as shown in the Work Order or as designated by the Engineer.

Gravel shall be windrowed prior to final spreading. Gravel shall be promptly and uniformly spread before darkness each day. In unanticipated situations where gravel windrows must be left overnight, the windrow shall be signed in accordance with the Department's Traffic Accommodation in Work Zones manual.

### 53.30.4 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, gravel must be spread smoothly and uniformly over the area being treated.

If requested by the Engineer, the Contractor is to provide the verification of the accuracy of the weigh scale used, as per 51.2.43.3, Verification of the Accuracy of a Weigh Scale.

### 53.30.5 TIME TO COMPLETE

The Contractor shall complete the Work within 60 days of the issuance of the Work Order.

### 53.30.6 MEASUREMENT AND PAYMENT

#### 53.30.6.1 **General**

Measurement will be made in tonnes of crushed gravel placed.

There will be no separate or additional payment when gravel surfacing is placed in more than one layer.

Payment for hauling will be made in accordance with Specification 55.2, Hauling.



If agreed by the Engineer and the Contractor that additional equipment, such as a water truck, is required to complete the Work (including dust control on haul roads and the work area), payment for such equipment will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

#### 53.30.6.2 **Department Supply of Gravel Surfacing Material**

Payment will be made at the unit price bid per tonne for "Gravel Surfacing - Pickup and Place (Dept. Supplied Gravel)". This payment will be full compensation for picking up and spreading gravel surfacing material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

#### 53.30.6.3 **Contractor Supply of Gravel Surfacing Material**

Payment will be made at the unit prices bid per tonne for "Gravel – Supply" and "Gravel – Place". These payments will be full compensation for supplying and spreading gravel surfacing material, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Payment for the supply of aggregate will be made in accordance with Specification 55.4, Supply of Aggregate.

#### 53.30.7 WARRANTY

There is no warranty period for this Work.

## 53.31 SUPPLY AND APPLY DUST ABATEMENT

### 53.31.1 GENERAL

The Work consists of supplying and applying materials as dust control for gravel roads.

### 53.31.2 MATERIALS

The Contractor shall supply the dust abatement material from the Alberta Transportation Products list however, the Engineer shall determine which dust abatement material will be used at specific locations.

The following dust abatement materials are commonly used in Alberta:

- Calcium Chloride (flake)
- lignosulphonate
- Liquid calcium chloride (brine)
- materials meeting Emulsified Dust Suppressant (EDS) Specifications.

### 53.31.3 PROCEDURES

The dust suppressant material shall be applied to the roadway surface to a minimum width of 7 m or greater width as determined by the Engineer. The completed treatment shall provide a smooth and relatively dust free surface.

The Contractor shall perform the work in accordance with the material supplier's recommended application rates, methods of roadway preparation, and placing of material unless otherwise directed by the Engineer.

### 53.31.4 TIME TO COMPLETE

The Contractor shall complete the Work within 30 days of the issuance of the Work Order.

### 53.31.5 MEASUREMENT AND PAYMENT

#### 53.31.5.1 **Liquid Calcium Chloride**

Measurement will be in litres of liquid calcium chloride solution (brine) applied to the roadway based on the application rate and area of roadway treated. If the area treated is not enough to use a full load of material, any surcharge for a partial load will be paid as Extra Work. For payment purposes, the litres of solution (brine) will be converted to a tonne equivalent of 77% calcium chloride flake based upon the solution percentage supplied as tested by the Engineer or shown in the manufacturer's analysis. The conversion factors which will be used are:

<b>Solution Percentage</b>	<b>litres per 77% Equivalent Flake tonne</b>
25%	2389
30%	1944
35%	1632

For example, if the Contractor applies 30 000 litres of 25% calcium chloride solution, payment will be made for:

$$30\ 000 \div 2389 = 12.56\ \text{t}$$

Further 30 000 litres of 30% solution would equal a 15.43 t payment

30 000 litres of 35% solution would equal an 18.38 t payment

Payment will be made at the unit price bid per tonne of calcium chloride at 77% calcium chloride flake equivalent for "Dust Abatement, Calcium Chloride - Supply and Apply". This payment will be full compensation for supplying and applying water, supplying and applying calcium chloride into the roadway surface, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

#### 53.31.5.2 Other Materials

Measurement will be in tonnes of material as per product requirement delivered to the work site based on the supplier's weigh bills. If the area treated is not enough to use a full load of material, any surcharge for a partial load will be paid as Extra Work.

Payment will be made at the unit price bid per tonne of lignosulphonate for "Dust Abatement, Lignosulphonate - Supply and Apply" or of EDS material for "Dust Abatement, EDS Material - Supply and Apply". This payment will be full compensation for supplying and applying water, supplying and applying lignosulphonate or supplying and applying EDS material into the roadway surface, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

#### 53.31.5.3 Surface Preparation

Measurement and payment for preparing the roadway surface, if required, will be made in accordance with Specification 53.27, Maintenance and Preparation of Gravel Surface Roads and Snow Removal and Ice Control on Gravel and Paved Surfaces.

#### 53.31.5.4 Gravel Surfacing

Measurement and payment for regravelling the roadway surface, if required, will be made in accordance with Specification 53.29, "Spot Gravelling" or Specification 53.30, "Gravel Surfacing".

#### 53.31.6 WARRANTY

The warranty period for this Work shall be 60 days.

**53.32 NOT USED**

## **53.33 MAINTENANCE OF LIVESTOCK GUARDS**

### **53.33.1 GENERAL**

#### **53.33.1.1 Cleaning and Inspection of Livestock Guards**

The Work consists of removing the livestock guard, cleaning out the trench, inspecting the livestock guard and performing minor repairs if necessary, reinstalling the livestock guard, and asphalt pavement surface patching or spot gravelling of the disturbed area. Repairs when required shall be completed in accordance with Specification 53.35, Installing, Repairing, or Removing and Disposing of Livestock Guards.

This Work will apply to livestock guards on approaches, gravel or dirt roads, or paved surface roads.

#### **53.33.1.2 Inspection of Livestock Guards**

The Work consists of inspecting the livestock guard, documenting deficiencies, and when necessary, repairing the livestock guard. Repairs when required shall be completed in accordance with Specification 53.35, Installing, Repairing, or Removing and Disposing of Livestock Guards.

Generally, this Work will apply to livestock guards on paved surfaces. Livestock guards across paved surfaces will be inspected on a three-year rotation, or as directed by the Engineer.

### **53.33.2 MATERIALS**

Steel shims, pavement patching materials, and gravel may be required to achieve a smooth transition between the adjacent roadway surface and the livestock guard.

### **53.33.3 PROCEDURES**

The Contractor shall make a reasonable effort to notify the landowner of the connecting private property prior to the commencement of the Work, if applicable. In the case of an Indian Reserve, the Band Office shall be notified.

When "cleaning and inspecting", the livestock guard and line fence shall be dismantled or removed to a sufficient degree to allow access to the trench for removal of all debris, soil, or other foreign matter from the trench. Other methods of cleaning (for example, using a hydrovac) and inspecting may be used upon approval of the Engineer.

After cleaning, the Contractor shall adjust and reinstall the guard in accordance with drawings CB6 2.13M4, CB6 2.13M5, CB6 2.13M6, CB6 2.13M7, CB6 2.13M11, or its original standard, as applicable, and all minor repairs shall be completed. The line fence shall be reinstalled in accordance with the drawings or site-specific requirements and the natural drainage course shall be maintained.

Minor pavement patching or spot gravelling shall be performed as directed by the Engineer to ensure a smooth transition from the roadway to the livestock guard.

All materials removed from the livestock guard trench shall be disposed of by the Contractor.

Inspection reports shall be submitted to the Engineer in a timely manner.

The Contractor shall prevent livestock from straying on to the right-of-way or adjoining property.

#### 53.33.4 ACCEPTANCE CRITERIA

All Work shall be performed in accordance with the specified requirements and to the satisfaction of the Engineer.

#### 53.33.5 TIME TO COMPLETE

The Work shall be completed within 60 days of the issuance of the Work Order.

#### 53.33.6 MEASUREMENT AND PAYMENT

Measurement will be made in metres of the width of the livestock guard. Width will be the dimension measured across the roadway.

##### 53.33.6.1 **Cleaning and Inspection of Livestock Guard**

Payment will be made at the unit price bid per metre for "Livestock Guard - Clean and Inspect". This payment will be full compensation for dismantling the livestock guard and line fence as required, performing a proper cleaning and inspection, providing an inspection report, reinstalling the livestock guard and line fence to conform to the original standards, patching the disturbed roadway surface, spot gravelling as required, containing livestock, maintaining natural drainage, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

Performing minor repairs to the livestock guard shall be paid as per Specification 53.35, Installing, Repairing, or Removing and Disposing of Livestock Guards.

##### 53.33.6.2 **Inspection of Livestock Guard**

Payment will be made at the unit price bid per metre of livestock guard for "Livestock Guard - Inspect." This payment will be full compensation for performing an inspection, providing an inspection report, and all labour, equipment, tools and incidentals necessary to complete the Work.

Performing minor repairs to the livestock guard shall be paid as per Specification 53.35, Installing, Repairing, or Removing and Disposing of Livestock Guards.

#### 53.33.7 WARRANTY

There is no warranty period for this Work.

## 53.34 SUPPLY OF LIVESTOCK GUARDS

### 53.34.1 GENERAL

#### 53.34.1.1 **Description**

Work consists of supplying livestock guards designed for safe passage of motor vehicles while safely prohibiting the passage of livestock.

#### 53.34.1.2 **Design Standards**

The Contractor shall provide full shop drawings showing all materials, including specification and grade of steel, all material sizes and/or dimensions, and all connections, including grades and sizes of bolts and sizes of weld. Drawings shall be fully dimensioned in metric units.

Designs shall be certified by a Professional Engineer, registered in the Province of Alberta, that they meet the specified load capacity for each type of livestock guard outlined herein.

In cases in which standards are quoted, such as the Canadian Standards Association (CSA) or the Canadian Welding Bureau (CWB), the latest edition shall be used.

The Contractor shall indicate patent information and ownership, if applicable. Ownership of the registered design will remain with the vendor.

### 53.34.2 MATERIALS

#### 53.34.2.1 **General**

The Contractor shall supply all materials required to complete the Work to the standards shown on the Department's drawings. Livestock guards shall be fabricated using new or used quality material as specified, and painted with a protective coating. Weathering steel which does not require paint is also acceptable.

Finished products shall be identified with a trademark and the date of manufacture stamped or welded in an area of the guard that can be easily read after installation.

Fencing details shown on the Department's drawings are for information only and, with the exception of the applicable fence post sleeves, shall not apply to this specification.

#### 53.34.2.2 **Types of Livestock Guard**

The various types of livestock guards are as follows:

##### 53.34.2.2.1 Standard Highway Type

Standard highway livestock guards are used on all paved and unpaved roads and are designed to carry legal highway vehicles at various speeds. Details are shown on drawings CB6 2.13 M5, M6, M7 and M11.

##### 53.34.2.2.2 Range Type

Range type livestock guards are designed to be used on lightly or seldom travelled roads with no more than standard farm or ranch vehicles. Details are shown on drawing CB6 2.13 M4.

### 53.34.2.2.3 Off-Highway Type

Off-highway type guards are used on logging or mining access roads where the load of the vehicles can exceed the legal highway limit. There may also be frequent light or average truck/car traffic. These guards shall be constructed in accordance with the applicable drawing for the required size with the increased load ratings detailed herein.

### 53.34.2.3 **Load Requirements**

In all load applications, the load shall be placed on the livestock guard in a location causing the greatest stress to the member in question.

#### 53.34.2.3.1 Live Load Requirements

The design of livestock guards shall be in accordance with the CSA Bridge Design Code S6-06 using a CL-800 design truck plus a dynamic load allowance.

### 53.34.3 PROCEDURES

#### 53.34.3.1 **General**

All livestock guards shall be constructed in accordance with the applicable drawings. (Skid plates are included in the drawings.)

Welding shall be performed by a company approved by the Canadian Welding Bureau to CSA Standard W47.1 with Work performed to CSA Standard W59.

#### 53.34.3.2 **Sill and Frame Construction**

The frame shall be designed to allow even distribution of live loads to the sills. The ends of the frame which contact the road surfaces shall include a fill guard to prevent road material from falling between the deck and sills. The fill guard shall be welded to the side of the livestock guard.

No splices are permitted in supporting members.

#### 53.34.3.3 **Deck Construction**

Deck construction shall consist of round structural tubing with dimensions as shown on the Department's drawings arranged perpendicular to traffic. Gusset reinforcement shall be used between each member. This reinforcement shall not permit the build-up of gravel or snow which may allow livestock to cross.

Fence post sleeves designed to accept a 60 mm outside diameter (O.D.) post shall be connected through the deck and attached to the frame at an outward 115-degree slant. The top of the sleeve shall not protrude above the deck.

Deck members shall be continuous over the length of the guard. Any splices shall develop the full strength of the member and shall be detailed on the drawings.

### 53.34.4 ACCEPTANCE CRITERIA

The Contractor shall supply the Engineer with the material manufacturer's certification that the material meets the Department's specifications. Generally, acceptance of the Work will be based upon the manufacturer's certification. However, the Engineer may also perform a visual inspection to determine if



materials supplied and workmanship are in accordance with the requirements of the specifications and drawings.

53.34.5 TIME TO COMPLETE

Livestock guards shall be supplied within 60 days of issuance of the Work Order.

53.34.6 MEASUREMENT AND PAYMENT

Measurement will be in metres of the width of each type of livestock guard supplied. Width will be the dimension measured across the roadway. Length will be the span of roadway covered by the guard and is usually 2.59 metres.

Payment will be made at the applicable unit price bid per metre for "Livestock Guard - Supply Range Type", "Livestock Guard - Supply Standard Highway Type" or "Livestock Guard - Supply Off-Highway Type". This payment will be full compensation for the design, certification, and production of shop drawings, supply of all materials, load rating tests, supplying the livestock guards to the job site, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

53.34.7 WARRANTY

The warranty period for this Work shall be 1 year.

## **53.35 INSTALLING, REPAIRING, OR REMOVING AND DISPOSING OF LIVESTOCK GUARDS**

### **53.35.1 GENERAL**

The Work consists of installing new livestock guards, repairing both the metal and wooden components of existing livestock guards, and removing and disposing of livestock guards, as identified by the Engineer.

### **53.35.2 MATERIALS**

The Contractor shall supply all materials required to complete the Work. Materials required to repair livestock guards shall be supplied in accordance with the requirements of Specification 53.34, Supply of Livestock Guards for the type of livestock guard being repaired.

### **53.35.3 PROCEDURES**

The Contractor shall make a reasonable effort to notify the landowner of the connecting private property prior to the commencement of the Work, if applicable. In the case of an Indian Reserve, the Band Office shall be notified.

The Contractor shall locate the damaged components of the livestock guard and determine whether repair or replacement of the components is required.

Before working on the timber portion of the guard, the metal sections shall be raised to remove the weight from the underlying timber structure. The Contractor shall replace any timber components as necessary.

The metal sections shall be repaired or replaced as necessary, including any welding work required on any of the components.

The new substructure shall be installed in accordance with the applicable specification.

All work shall be completed to the required standard and the livestock guard shall be safe for vehicular traffic.

When removing and disposing of a livestock guard, the hole shall be filled with pit-run and gravel and the area shall be patched in accordance with Specification 53.2, Pit-Run Gravel, Specification 55.2, Hauling and Specification 53.13, Asphalt Pavement - Surface Patching.

All materials removed from the existing livestock guard shall be disposed of by the Contractor.

### **53.35.4 ACCEPTANCE CRITERIA**

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, the materials supplied and the workmanship performed shall conform to the requirements of the specifications and drawings.

### **53.35.5 RESPONSE TIME AND TIME TO COMPLETE**

In urgent situations, the Contractor shall have commenced the Work within 1 hour of the issuance of the Work Order. In all other cases, the Work shall be completed within 5 days of the issuance of the Work Order.

53.35.6 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest ¼ hour) for the time spent travelling to and from the worksite, travelling between worksites, and to complete each type of Work in accordance with the following:

- the maximum allowable travel time from the nearest shop to the worksite will be one hour
- the maximum allowable travel time from the worksite to the nearest shop will be one hour
- travel time between sites will be based on the shortest distance between sites
- travel time shall be reported separately on a daily crew worksheet
- two 15 minute coffee breaks per day will be allowed (no deduction)

The travel time to each specific job site will be agreed to by the Engineer and the Contractor prior to issuing the Work Order.

The types of Work are repairing the metal structure, repairing the wooden substructure, repairing both the wooden and metal structure, installing a new livestock guard, and removing and disposing of the old livestock guard.

Payment will be made at the applicable unit price bid per hour for "Livestock Guard - Repair Metal Sections", "Livestock Guard - Repair Wooden Sections" or "Livestock Guard - Install Complete". The applicable payment will be full compensation for dismantling the installation to the extent necessary to make repairs, installing the substructure, installing the guard to a condition conforming to the applicable drawings, ensuring a smooth transition on and off the deck, and all labour, equipment, tools, and incidentals necessary to complete the Work.

Payment for the supply of metal and wooden components, excluding welding materials, will be made as Extra Work in accordance with Specification 51.2, General (for Maintenance Work.)

Payment for new substructure or revisions to the existing substructure will be made as Extra Work.

The bid item for "Livestock Guard - Install Complete" applies to both the removal of existing livestock guards and to the installation of new livestock guards when necessary. When complete installations of new livestock guards are required, payment for the supply of the livestock guard will be made in accordance with Specification 53.34, Supply of Livestock Guards and payment for installation will be made at the unit price bid per hour for "Livestock Guard - Install Complete". Additional payment will not be made for any other materials necessary to complete the Work.

In urgent situations where the Contractor is required to respond within 1 hour of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Livestock Guard - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

No payment will be made for the Work involved in replacing or repairing substandard new guards which are under the 1 year warranty specified in Specification 53.34, Supply of Livestock Guards.

53.35.7 WARRANTY

The warranty period for this Work shall be 60 days.

## 53.36 EMERGENCY SIGN PACKAGE

### 53.36.1 GENERAL

The Work consists of storing Emergency Signs and associated equipment supplied by the Department and maintaining the signs and equipment in an acceptable condition for the term of the Contract. The Work also consists of using these signs to accommodate traffic in emergency situations or as directed by the Engineer, where a closure of the highway or a driving lane is necessary.

For emergency situations or as directed by the Engineer where a short term closure is necessary, the emergency sign package would not normally be used. Such situations would be handled through the use of flagpersons and work zone signs in accordance with Specification 53.37, Supply of Flagpersons for Emergency Traffic Control.

### 53.36.2 MATERIALS

The Department will supply the Contractor with the required number of Emergency Sign Packages each containing the following signs. The Department will also supply appropriate sign stands, flags, flag mounts, and bolts (for the barricades/sign assembly). All components of the Emergency Sign Package shall be returned to the Department in good condition upon the termination of the Contract. The Contractor shall be responsible to determine when components in the package require replacement. When they need replacement due to normal usage, they will be supplied by the Department. If components are missing or damaged due to the Contractor's negligence, the Contractor shall immediately replace such components at his expense.

All replacement signs shall use high intensity retro-reflective sheeting in accordance with ASTM-D4956 or fluorescent orange sheeting material in accordance with the Alberta Transportation Products list.

Sign	Reference Standard	Amount Required	
		2 Lane	Multi-Lane
Road Closed	WD-116-2	8	16
Hazard Board	WD-116-1R	8	16
Hazard Board	WD-116-1L	8	16
Barricade Stands	For WD-116	16	32
Barricade Ahead	WD-104	2	4
Flagman	WD-A-45	2	4
Detour (Tab)	WD-A-44-T	6	12
Detour Next _ Kms	WD-103	2	4
-Pocket	WD-103	2	4
-Numbers (sets)	WD-103	2	4
Begin Detour 300 m	WD-102	2	4
Barricade Arrow	WD-116-5	6	12
Be Prepared To Stop	WD-111	2	4
Maximum Speed Ahead 50	RB-5	2	4

Sign	Reference Standard	Amount Required	
		2 Lane	Multi-Lane
Maximum 50	RB-1	2	4
Smoke Ahead	WD-175	4	6
One Lane Traffic	WD-106	0	6
Left Lane Ends	WD-A-33L	0	6
Right Lane Ends	WD-A-33R	0	6
Two Way Traffic Ahead	WD-B-3	0	6
Two Way Traffic Ahead Tab	WB-3-T	0	6
Stop/Slow Paddles	TCS-B-4.3	2	4
Flashing Amber Lights – Battery Operated	-	10	10
Replacement Batteries	-	20	20
Flashing Amber Lights – Solar Powered	-	See Special Provisions	See Special Provisions
Traffic Cones	71 cm	20	50

### 53.36.3 STORAGE LOCATIONS

The Contractor shall supply storage locations within the Contract area boundaries, as outlined in the Special Provisions.

The Contractor shall supply an enclosed wheeled mobile storage unit (enclosed trailers) for each Emergency Sign Package in the CMA, which has the capability of storing it in the appropriate shop location and mobilizing it to the appropriate incident location when required. Each unit shall be capable of storing a complete Emergency Sign Package required for the identified area. The units (sign package and trailer) shall be capable of being mobilized to any incident location. The Department requires the Emergency Sign Packages owned by the Department to be stored, including the wheeled mobile storage units, free of charge by the Contractor at the sites outlined in the Special Provisions. The licensing, storage, and maintenance of these trailers and their contents are the responsibility of the Contractor, and is incidental to the Work. The trailers may be stored either inside a building or outside; they need to be easily accessible and ready to respond within the appropriate time requirements.

### 53.36.4 PROCEDURES

The Contractor shall provide covered storage for emergency sign packages supplied by the Department, and shall maintain the signs in an acceptable condition throughout the term of the Contract. The Contractor shall ensure all signs are available for immediate use in a long term lane closure at any time during the term of the contract. The Contractor shall not use the signs in the emergency sign package for any other purpose without approval of the Engineer.

53.36.5 RESPONSE TIME AND TIME TO COMPLETE

The Contractor shall respond within 1 hour of the issuance of the Work Order and shall erect the signs on-site within the time period specified in the Special Provisions. (Normally 2 to 4 hours)

53.36.6 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest 1/4 hour) for the time spent picking up the sign package, hauling it to the worksite, erecting it, taking it down, and hauling it back to the storage location.

Payment will be made at the unit price bid per hour for "Erect and Remove Emergency Sign Package." This payment will be full compensation for loading, erecting, removing, and unloading the signs as required and all labour, material, equipment, tools and incidentals necessary to complete the Work.

Subsequent to installation of signs at a site, any required maintenance including cleaning, repair, re-erecting, or relocating (same site) of the signs will be considered a component of Specification 53.39, Highway Maintenance Work and no separate or additional payment will be made. Periodic inspection of the site will be considered an Additional Road Inspection in accordance with Specification 53.39.

No separate or additional payment will be made for providing covered storage or for maintaining the emergency sign packages.

53.36.7 WARRANTY

There is no warranty period for this Work.

## 53.37 SUPPLY OF FLAGPERSONS, SIGNS, AND VEHICLES FOR TRAFFIC CONTROL

### 53.37.1 GENERAL

The Work consists of providing certified flagpersons, signs, traffic cones, and vehicles for controlling traffic in emergency situations as directed by the Engineer. In situations where flagpersons are required continuously, for extended periods of time, the use of the "Emergency Sign Package" (specification 53.36) may also be required.

This specification is not intended to cover the provision of flagpersons which may be required for traffic accommodation as part of typical highway maintenance activities as detailed in the Department's Traffic Accommodation in Work Zones manual.

### 53.37.2 MATERIALS

The Contractor shall supply and maintain sufficient types and quantities of signs to accommodate traffic during lane closures. The types of signs required are shown on drawings TCS-B-2.1B and TCS-B-2.1A of the latest edition of the Traffic Accommodation in Work Zones manual.

For short term road closures or as directed by the Engineer, the use of the "Emergency Sign Package", as detailed in Specification 53.36, may be required.

### 53.37.3 EQUIPMENT

The Contractor shall supply a vehicle capable of transporting the flagpersons, traffic cones, and signs to the site.

In an Emergency Situation, if it is agreed that an additional vehicle is required (during inclement weather, darkness, or for safety reasons), the vehicle will be provided for through 55.6, Supply of Labour and Trucks for Miscellaneous Work.

### 53.37.4 PROCEDURES

Flagpersons shall be trained and equipped in accordance with the applicable sections of Specification 51.2, General (for Maintenance Work).

Where there are 2 or more flagpersons working together, each flagperson shall have a 2-way hand-held radio for communication with each other and the work crew.

The Contractor shall erect the temporary signs as required and maintain, reposition, and remove the signs when necessary. The Contractor shall ensure that maintaining signs is performed by someone other than the flagperson.

### 53.37.5 RESPONSE TIME

In urgent situations the Contractor shall respond within 1 hour of the issuance of the Work Order. In all other situations, the response time shall be a maximum of 5 days as specified in the Work Order.

### 53.37.6 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest ¼ hour) for the time the signs and vehicle and/or flagperson spend travelling to and from the worksite, loading and unloading signs, and are engaged in the Work in accordance with the following:

- a minimum of 3 hours, including travel time, per flagperson, per Work Order will apply
- loading and unloading signs will be considered 15 minutes each
- the maximum allowable travel time from the nearest shop to the worksite will be one hour
- the maximum allowable travel time from the worksite to the nearest shop will be one hour
- travel time will be paid for crew changes at the end of a regular shift. (travel time will be paid at the unit price bid per hour for "Supply of Flagperson" for both the working crew and the relief crew)
- two 15 minute coffee breaks per day will be allowed (no deduction)

Payment will be made at the unit price bid per hour for "Supply Flagperson, Signs, and Vehicle." This payment shall be full compensation for providing a fully equipped flagperson, supplying, erecting, and maintaining all temporary signs, supplying a vehicle for delivering the signs to and from the site, loading and unloading of signs, travel time to and from the site, controlling traffic, and all labour, materials, equipment, tools, and incidentals necessary to complete the Work.

In cases where only a flagperson is required, payment will be made at the unit price bid per hour for "Supply Flagperson." This payment shall be full compensation for the supply of a fully equipped flagperson, travel time to and from the site, controlling traffic, and all labour, material, tools, and incidentals necessary to complete the Work.

In urgent situations, where the Contractor is required to respond within 1 hour of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Traffic Control - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work. This payment will also be full compensation for complying with accelerated scheduling requirements for a truck mounted arrowboard and/or a stationary arrowboard, in accordance with Specification 53.38, Supply of Arrowboards and Dynamic Message Signs for Traffic Control, when these items are required by the Engineer.

#### 53.37.7 WARRANTY

There is no warranty period for this Work.



## **53.38 SUPPLY OF ARROWBOARDS AND DYNAMIC MESSAGE SIGNS FOR TRAFFIC CONTROL**

### **53.38.1 GENERAL**

The Work consists of supplying truck mounted and/or trailer mounted arrowboards and/or dynamic message signs for controlling traffic in emergency situations and for planned maintenance activities.

In unique situations, such as cleaning overhead signs or winging inside shoulders on divided highways, a truck or trailer mounted arrowboard may be ordered by the Engineer. Arrowboards may also be required as part of the normal traffic accommodation for an activity, as specified in the Department's Traffic Accommodation in Work Zones manual or the specifications.

When deemed necessary by the Engineer, a truck or trailer mounted dynamic message sign may be ordered to provide motorists with advanced warning of emergency situations or planned maintenance activities.

### **53.38.2 EQUIPMENT**

#### **53.38.2.1 General**

The Contractor shall supply all equipment necessary to complete the Work.

#### **53.38.2.2 Trucks**

Trucks mounted with arrowboards or dynamic message signs shall be equipped with the following:

- A truck-to-truck voice communication device.
- An overhead revolving beacon with an amber lens a minimum of 180 mm high and 180 mm wide, or other equivalent type beacon approved by the Engineer. The beacon shall be mounted on the vehicle fully visible to traffic approaching from both front and rear.
- The arrowboard or dynamic message sign shall be controlled from a console located in the vehicle cab.
- The arrowboard or dynamic message sign display shall be visible to traffic approaching the rear of the truck.

#### **53.38.2.3 Trailers**

Trailers mounted with an arrowboard or dynamic message sign shall be designed for towing at highway speeds and shall comply with Alberta's Traffic Safety Act. Arrowboards and dynamic message signs mounted on trailers are not intended for mobile use and shall remain stationary when operating.

#### **53.38.2.4 Arrowboards**

##### **53.38.2.4.1 Truck Mounted**

All truck mounted arrowboards shall meet the following requirements:

- Minimum size 0.75 metres x 1.52 metres (2.5 ft. x 5 ft.).
- Minimum of 25 lamps that are legible at a minimum distance of 1 200 metres.

- Fully adjustable light intensity on all arrowboard lights.
- Operating modes which include:
  - (1) sequential left arrow or chevron
  - (2) sequential right arrow or chevron
  - (3) sequential double arrow or chevron
  - (4) horizontal bar
  - (5) capable of all 4 lamps in the extreme corners of the panel shall be flashing

#### 53.38.2.4.2 Trailer Mounted

All trailer mounted arrowboards shall meet the following requirements:

- Minimum size 1.22 metres x 2.44 metres (4 ft. x 8 ft.).
- Minimum of 25 lamps that are legible at a minimum distance of 1 200 metres.
- Fully adjustable light intensity on all arrowboard lights.
- Operating modes which include:
  - (1) sequential left arrow or chevron
  - (2) sequential right arrow or chevron
  - (3) sequential double arrow or chevron
  - (4) horizontal bar
  - (5) capable of all 4 lamps in the extreme corners of the panel shall be flashing

#### 53.38.2.5 **Dynamic Message Signs**

All truck and trailer mounted dynamic message signs shall be capable of:

- Accepting user-programmed and pre-programmed messages,
- Displaying two different messages in sequence,
- Messages being clearly visible in daylight,
- Messages being clearly visible in darkness without another light source,
- Letter size up to 450 mm in height,
- Continuous operation for a minimum of 12 hours.
- Displaying all alphabetical characters from A-Z in upper and lower case, and numbers 0-9.
- Displaying three lines of 8 characters

#### 53.38.3 PROCEDURES

Unless otherwise specified, the Engineer shall notify the Contractor of the location where arrowboards or dynamic message signs are required.

On any sites where arrowboards or dynamic message signs are required, the Contractor shall refer to the Traffic Accommodation in Work Zones manual for proper positioning.

When a truck mounted arrowboard or dynamic message sign is stationary, the Contractor shall ensure that the front wheels of the truck are turned towards the adjacent ditch.

Arrowboard displays shall be one of the following:

- On a 2 Lane Highway, 4 flashing corner lights or a bar.
- On a 4 Lane Highway, a right arrow when operating in the left lane and a left arrow when operating in the right lane.

- On a single lane road (for example, the exit leg of an interchange), 4 flashing corner lights or a bar.

#### 53.38.4 RESPONSE TIME AND TIME TO COMPLETE

In urgent situations, the Contractor shall respond within 1 hour of the issuance of the Work Order for an arrowboard. Dynamic message signs will not be subject to this rapid response time.

In all other cases, the arrowboard or dynamic message sign shall be supplied within 5 calendar days of the issuance of the Work Order or in conjunction with the activity being performed.

#### 53.38.5 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest 1/4 hour) for the time spent transporting the arrowboard or dynamic message sign to and from the worksite and for the time the arrowboard or dynamic message sign is engaged in the Work in accordance with the following:

- the maximum allowable travel time from the nearest shop to the worksite will be one hour
- the maximum allowable travel time from the worksite to the nearest shop will be one hour
- travel time shall be reported separately on a daily crew worksheet
- two 15 minute coffee breaks per day for the operator of a mobile truck mounted arrowboard will be allowed (no deduction)

Payment will be made at the applicable unit price bid per hour for:

"Supply of Truck Mounted Arrowboard - Mobile", or  
"Supply of Truck Mounted Arrowboard - Stationary", or  
"Supply of Trailer Mounted Arrowboard ", or  
"Supply of Truck Mounted Dynamic Message Sign – Mobile", or  
"Supply of Truck Mounted Dynamic Message Sign – Stationary", or  
"Supply of Trailer Mounted Dynamic Message Sign".

This payment shall be full compensation for supplying and maintaining a truck mounted or trailer mounted arrowboard or dynamic message sign and additional transport equipment including an operator where applicable, travel time to and from worksite, and all labour, equipment, tools, and incidentals necessary to complete the Work.

In urgent situations where the Contractor is required to respond within 1 hour of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Traffic Control - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work. This premium will not be issued when a premium is issued for flagperson traffic control from spec 53.37, Supply of Flagperson for Emergency Traffic Control.

In situations where the arrowboard or dynamic message sign is part of the traffic accommodation requirements for a particular activity (as detailed in the Traffic Accommodation in Work Zones manual or the specifications), all costs associated with the supply and use of an arrowboard or dynamic message sign will be considered incidental to the Work and will not be paid for separately.

#### 53.38.6 WARRANTY

There is no warranty period for this Work.

## 53.39 HIGHWAY MAINTENANCE WORK

### 53.39.1 GENERAL

The Work consists of the following:

#### 53.39.1.1 **Road Inspections**

Patrolling the Contract area, both on a scheduled basis and as detailed in the Special Provisions, or as directed by the Engineer, to monitor and report weather or roadway conditions, work, and hazards.

#### 53.39.1.2 **Emergency Duties**

Immediately responding to conditions that are hazardous to road users.

#### 53.39.1.3 **Routine Highway Maintenance Activities**

Attending to minor maintenance items (as outlined in 53.39.4.4, Routine Highway Maintenance Activities) during normal working hours, and informing the Engineer of any maintenance items that require attention by Work Order. Normal working hours are 7 am to 5 pm, Monday through Friday, excluding statutory holidays.

### 53.39.2 MATERIALS

The Contractor shall supply all materials necessary to complete the Work.

#### 53.39.2.1 **Incidental Materials**

The following materials shall be supplied as part of Routine Highway Maintenance Activities:

- Garbage bags for daily use (excluding scheduled refuse pickup programs),
- Lath, orange flags, and orange ribbon,
- Suitable material for temporary repairs on critical regulatory signs
- Spill-absorbing material such as Absorb-All or sand,
- Personal protective equipment for handling animal carcasses and other waste,
- Appropriate cleanser for the removal of graffiti,
- Temporary 4-way STOP signs on portable stands, to be used when traffic signals are not operating. The number of sign sets supplied are detailed in the Special Provisions,
- "Police Emergency Ahead" signs in accordance with Drawing WD-200 of Alberta Transportation's Sign Catalogue, mounted on portable stands, to be used as the first traffic control device on the scene when police have responded to a highway emergency situation such as a collision, spill, or obstruction on the highway. The number of "Police Emergency Ahead" signs required are detailed in the Special Provisions.
- Fencing materials for repair of line fence classified as a Routine Highway Maintenance Activity,

- Posts and markers for installation of red diamond hazard markers,
- Supplies for roadside toilets (toilet paper, toilet chemicals, roofing repair materials, etc.)
- Replacement bulbs/LED components for traffic signals, as outlined in the Special Provisions, and
- All other applicable cleaning supplies.

### 53.39.3 EQUIPMENT

All vehicles used in transporting litter (including road kill) shall be equipped to prevent the accumulated litter from being re-deposited on or along the highway. Vehicles must be able to remove large road kill from the right-of-way and transport it to a suitable disposal site.

The Engineer may authorize the use of heavy equipment/larger truck to remove and dispose of large road kill or debris if in his opinion, the animal or debris is too large for a one ton truck.

### 53.39.4 PROCEDURE

#### 53.39.4.1 **General**

The Contractor shall provide sufficient resources to regularly patrol the specified roads within each Contract area as shown in the Special Provisions, to observe, react to, and report all circumstances or conditions affecting the travelling public or the future repair of the roadway or appurtenances; to investigate reports of adverse conditions from members of the public, regulatory agencies, police authorities, or a Department official; and to perform all Routine Highway Maintenance Activities.

#### 53.39.4.2 **Road Inspections**

##### 53.39.4.2.1 Scheduled Road Inspections

Scheduled Road Inspections shall consist of patrolling roads within the Contract area boundaries and responding to Emergency Duties and any other issues or conditions concerning the safety of the travelling public. The specific roads to be patrolled and the frequencies of the inspections will be specified in the Special Provisions.

The Contractor shall identify and document all deficiencies observed during road inspections and shall submit this information to the Engineer on a weekly basis. The Department will supply the Contractor with a copy of a standard form they can use for road inspection reporting.

As part of normal winter duties, the Contractor shall provide Winter Road Reports to the Alberta Motor Association. These reports shall detail driving conditions on the applicable highways within the Contract area boundaries. The report shall be updated as outlined in the Special Provisions and as required, to ensure that the travelling public is kept current with changing roadway or weather conditions. The Department and the Contractor can query the [www.abrr.ca](http://www.abrr.ca) website to get reports/status updates.

##### 53.39.4.2.2 Additional Road Inspections (Planned)

The Engineer may direct the Contractor to perform road inspections in addition to the Scheduled Road Inspections specified in the Special Provisions.

These Additional Road Inspections are scheduled or planned, they are for a known circuit or highway, they can be any time of year, and they can occur during or after working hours.

#### 53.39.4.2.3 Reactionary Inspections (Unplanned)

In addition to the Scheduled Road Inspections specified in the Special Provisions, the Additional Road Inspections required by the Engineer, and undertaking Routine Highway Maintenance Activities, it may be necessary for the Contractor to perform separate Reactionary Inspections. A Reactionary Inspection is an unplanned inspection required during normal working hours to inspect potentially unsafe road conditions, adverse weather condition, or incident within the CMA boundaries. The Contractor would normally become aware of the unsafe condition, adverse weather condition, or incident through notification by the RCMP, the travelling public, the Department, or his own forces.

#### 53.39.4.2.4 Routine Observations

During the performance of Road Inspections, Emergency Duties, Routine Highway Maintenance Activities or at any other time the Contractors' personnel are travelling within the Contract area boundaries, such personnel shall observe conditions of the roadway surface, appurtenances, and right of way for the purpose of identifying Work to be performed. The Contractor shall report any such Work to the Engineer.

Any Work identified which falls under the category of Emergency Duties shall be immediately addressed by the Contractor.

Items of Work which would typically be identified during Routine Observations include but are not limited to the following:

- Damaged signs,
- Drainage problems including blockages, erosion or lack of capacity of ditches, culverts and drainage grates, particularly during spring thaw and run-off. The Contractor shall make interim repairs in these areas when possible.
- Any required cleaning, litter removal, or snow removal at roadside turnouts and vehicle inspection stations.
- Damaged structures or appurtenances (guardrail, light standards, bridges, etc.)
- Roadside or median barriers which have been damaged or moved from the original position, or any other condition that prevents the barrier from performing its intended function.

#### 53.39.4.3 **Emergency Duties**

The following are critical items that require immediate response:

- Repairing or replacing critical regulatory signs (STOP and YIELD) or performing temporary repairs of signs.
- Removing from the road surface, roadkill and debris of a size or type that may create a hazard.

If an animal is injured, the Contractor shall contact the RCMP or Alberta Sustainable Resource Development - Fish and Wildlife, who will determine and arrange for the treatment required.

In cases involving domestic animals, the Contractor shall remove the carcass from the roadway surface and contact the owner of the animal to dispose of the carcass. If the owner cannot be

contacted, the Contractor shall remove the carcass from the right-of-way, dispose of the carcass at an approved site, and immediately notify the Engineer.

Ultimately, the Contractor shall remove all such hazardous items from the right-of-way.

- Repairing traffic signals, including:
  - Resetting signals if the lights are in flash mode,
  - Replacing burnt-out bulbs, or
  - When the lights are completely out of service, setting up portable STOP signs from all directions until permanent repairs occur.
- Responding to collisions or natural disasters, including:
  - Traffic control, erecting detours or barricades in accordance with Specification 53.36, Supply and Erection of Emergency Signs,
  - Removing from the highway surface, any material including damaged guardrail which presents a hazard to the travelling public, and
  - Applying absorbent material to minor spills at accidents.
- Dispatching snow and ice control equipment to rectify unsafe or poor driving conditions resulting from:
  - sections of packed snow,
  - sections of ice,
  - ice on bridge decks,
  - drifting snow,
  - freezing rain, and
  - any highways requiring snowplowing.
- Providing adequate marking of any conditions on the road surface or in the right-of-way which are a hazard to the travelling public.
- Emergency repair and marking of unsafe or poor pavement conditions such as:
  - potholes,
  - frost heaves,
  - severe tearing or deterioration of the pavement surface, and
  - breaking of the pavement edge.
- Emergency repair and marking of unsafe or poor gravel highway conditions such as:
  - potholes,
  - severe washboard sections,
  - areas of erosion,
  - lack of gravel, and
  - loose gravel.
- Emergency repair and/or marking of unsafe or poor bridge conditions such as:
  - oversize load collisions,
  - overload damage,
  - hazards or damage created by other types of incidents,

- loose or protruding deck joint plates,
  - severe deflection of culverts, and
  - any other item or condition on a bridge structure that presents a danger to the travelling public.
- Reporting any instance where immediate response was required to the Engineer.
  - Placing "Police Emergency Ahead" signs at the scene of collisions, spills, or obstructions on the highway.

#### 53.39.4.4 Routine Highway Maintenance Activities

The Contractor's regular schedule shall include:

- Servicing Department litter bins, recycle bins, and toilet facilities adjacent to provincial highways.

For litter bins and recycle bins, the work shall include emptying containers, replacing plastic garbage bags with a new bag and disposing of collected litter/recyclable, hand picking any litter at the litter station and adjacent ditches from the point at which the pavement widens to the point at which it returns to the typical shoulder, immediately reporting any vandalism to the Engineer, performing minor repairs to the litter and recycle bins such as replacing hinges or fastening loose boards, and keeping the area in front of the bins free of obstructions such as holes, trees, brush, and snow.

For toilet facilities, the Special Provisions outline the locations and type of facility in a CMA. The Work shall include all activities below applicable to the facility:

- Daily, as outlined in the Special Provisions, or as agreed with the Operations Manager:
  - Clean the floor.
  - Add paper as necessary.
  - Add hand cleaner as necessary.
  - Check garbage can and remove garbage when ½ full (and refill with empty bag).
  - Check service room for unusual mechanical noises or water in crawl space.
  - Compare room temperature in both sides. If too high in one side, water lines may have to be rebalanced.
  - Check door lock operation.
- Weekly, as outlined in the Special Provisions, or as agreed with the Operations Manager:
  - Check filter in Heat Recovery Ventilator (HRV).
  - Check water level in glycol makeup water tank.
  - Wash floor and walls. Open floor drain with screw driver. Clean graffiti with vinegar, turpentine, solvent, acetone, etc. as appropriate.
  - Check tightness of all fixtures. Check seat lids for cracks.
  - Check interior light bulb operation.
- Monthly, as outlined in the Special Provisions, or as agreed with the Operations Manager:
  - Check photocell and motion-sensor operation.
  - Check exterior light bulb operation.
  - Wash filter in HRV.
  - Check tightness of HRV pipes, door frame, hinges.
  - Check effluent level. Add water if effluent is piling rather than spreading. Empty/pump out when effluent is up to bottom of drop tube.
  - Check UPS power level.
- Annually, as outlined in the Special Provisions, or as agreed with the Operations Manager:



- Check boiler, valve, and pump operation.
- Flush heating lines and replace glycol mixture; dispose of glycol properly.
- Check caulking, paint, and roof metal tightness.

The Work at toilet facilities will also consist of hand picking litter around toilets and pathways, mowing or clearing snow (at least 2 m wide) from pathways and keeping the pathways free of obstructions such as holes, trees, brush and snow, and other minor repairs.

When cleaning septic tanks, the area surrounding the tank shall be cleaned of any spills. All waste material shall be hauled to and disposed of at a proper waste disposal site.

- Removing and disposing of incidental refuse, debris, and litter from within the right-of-way which can be reasonably handled by one person and loaded into a half ton truck.
- Straightening or reinstalling sign posts as follows:
  - Posts shall be straightened using hand tools and/or a winch when they are visibly off plumb.
  - Reinstalling “removed/vandalized” posts into the existing hole (including cleaning out the hole by hand or using hand tools when necessary).
  - Shimming and tightening connections on breakaway sign posts as required.
- Straightening or reinstalling delineator posts and replacing reflective strips on guardrails and delineator posts.
- “Summerising” signals and control boxes by:
  - Thoroughly cleaning the interior of the controller cabinet with a brush and vacuum cleaner. When vacuuming, care must be taken in order that the nozzle does not make contact with any cabinet wire terminals as this may short circuit the cabinet and cause controller failure. A plastic nozzle shall be used when available.
  - If the controller cabinet has a forced air heater, the heater shall be turned to the “Off” position or unplugged completely. If the controller cabinet has a strip heater, the heater control switch shall be turned to the “Off” position.
  - The cooling fan on the top of the cabinet shall be checked for operating function by turning the thermostat to low position. If working, the thermostat shall be turned back to the 30°C or 85°F setting.
  - The wooden or plastic board blocking the lower ventilation openings on the cabinet door shall be removed and replaced with a clean air filter of the correct size.
  - All signal indications shall be checked to ensure that all lamps are functioning and the lenses, where necessary, shall be cleaned with glass cleaner and a cloth. The interior of the signal heads (reflectors) shall also be cleaned.
- “Winterising” signals and control boxes by:
  - Thoroughly cleaning the interior of the controller cabinet with a brush and vacuum cleaner. When vacuuming, care shall be taken in order that the nozzle does not make contact with any cabinet wire terminals as this may short circuit the cabinet and cause controller failure. A plastic nozzle shall be used when available.
  - If the controller cabinet has a forced air heater, the heater shall be turned to the “Medium” temperature and plugged into the duplex receptacle. If the controller cabinet has a strip heater, the heater control switch shall be turned to the "On" position.
  - The air filter at the lower opening on the cabinet door shall be removed and replaced with a wooden or plastic board of a size that fits into the holder and blocks the ventilation openings.

- All signal indications shall be checked to ensure that all lamps are functioning and the lenses, where necessary, shall be cleaned with glass cleaner and a cloth. The interior of the signal heads (reflectors) shall also be cleaned.
- Washing signs, delineators, and reflective strips on guardrail. If soap is used, it must be biodegradable.
- Removing graffiti from all sites accessible without man-lift equipment. Care shall be taken when removing graffiti from signs to prevent the sign message from being removed as well. Cases in which the graffiti cannot be removed or is inaccessible shall be reported to the Engineer.
- Removing and storing of non-conforming signs less than 1 m<sup>2</sup> from within the right-of-way. Prior to removal of any non-conforming signs, the Contractor shall contact the Engineer for confirmation and after removal the signs shall be stored for a minimum of six months. After six months, the Contractor shall contact the Engineer for instructions on disposal of the stored signs. Sign disposal is incidental to this work.
- Obtaining frost probe readings and reporting such information to Alberta Transportation, Commercial Vehicle Enforcement, as directed by the Engineer.
- Performing minor fencing repairs and installations on Department owned fence line and wire gates. Such work shall consist of attaching or splicing wires at one or both ends, tightening up to 50 metres of barbed wire, and reinstalling fence posts.
- Removing and disposing of refuse which has been collected by other forces (ex. Annual Highway Clean Up and Caring for Alberta's Highways programs). The litter shall be disposed of at authorized disposal sites.
- Performing minor culvert and drainage grate maintenance, including the inspection of culvert or grate to determine needs, reporting major work that may be required, removing minor blockages (garbage, siltation, vegetation) with hand tools, and disposal of debris.

This activity shall apply only to debris removed from the immediate sloped end of the culvert. Removal of debris from the barrel of the pipe shall be performed and paid for in accordance with Specification 54.6, Cleaning Debris from Culverts. In late summer, culverts and drainage systems shall be checked for blockages by debris. A schedule for cleaning shall be established and the work shall be completed prior to freeze-up.

This work shall be carried out on all blockages in culvert ends that could restrict water flow.

- Performing minor maintenance of permanent snow fence (i.e., replacing broken ties, replacing up to 10 wooden slats per 100 m, etc.)
- Repairing potholes in accordance with Specification 53.10, Pothole Patching by Hand.

The frequency and/or amount of work to be performed for the work items included in 53.39.4.4, Routine Highway Maintenance Activities is outlined in the Special Provisions. However, highway inventory and appurtenances may vary throughout the course of the contract. Increases or decreases in the frequencies and/or amounts of work identified in the Special Provisions shall not relieve the Contractor from his responsibility to complete the work at intervals required by the Engineer. An increase/decrease in payment due to significant changes in the frequency and/or amount of work may be negotiated between the Engineer and the Contractor.

### 53.39.5 REPORTING PROCEDURES

All items listed under Section 53.39.4.3, Emergency Duties shall be reported immediately to the Engineer.

The Contractor shall record conditions identified during Road Inspections, and any Work performed as a result of his observations. Such information shall be reported to the Engineer. The report shall make a distinction between conditions that required immediate response and those that could be scheduled as future Work.

The Contractor shall record and report monthly, all Routine Highway Maintenance Activities performed. These reports shall include:

- segment(s) worked,
- action(s) taken, and
- quantities of work performed,

The frequency for submitting Winter Road Reports to Alberta Motor Association shall be detailed in the Special Provisions.

When required by the Special Provisions, the Contractor shall report wildlife roadkill to Alberta Sustainable Resource Development, Fish and Wildlife.

### 53.39.6 RESPONSE TIME AND TIME TO COMPLETE

#### 53.39.6.1 **Road Inspections**

The frequency and timing of Scheduled Road Inspections (including Winter Road Inspections) will be detailed in the Special Provisions.

Additional Road Inspections required on an "on demand" basis shall be completed within the time stated on the Work Order or as required by the Engineer.

#### 53.39.6.2 **Emergency Duties**

Response for Emergency Duties shall be immediate. The Contractor shall notify the Engineer of any cases where two or more critical items occur in a manner which prevents immediate response. The Contractor shall take all reasonable steps to determine and attend to priorities.

#### 53.39.6.3 **Routine Highway Maintenance Activities**

Timelines for the completion of Routine Highway Maintenance Activities will be established by the Engineer, with the Contractor, generally at the regular Operational Planning meetings. In the event the Engineer and Contractor cannot agree on the timelines for the performance of the Work, such Work shall be completed within 30 days of the date of the applicable Operational Planning Meeting or from the time the Work is ordered, as applicable.

53.39.7 MEASUREMENT AND PAYMENT

53.39.7.1 **Scheduled and Reactionary Road Inspections, Emergency Duties and Routine Highway Maintenance Activities**

Payment will be made at the unit price bid per month, per Contract Maintenance Area (CMA), for "Highway Maintenance Work". This payment will be full compensation for performing all required Scheduled Road Inspections including Routine Observations and Winter Road Reports, Reactionary Road Inspections, Emergency Duties, Routine Highway Maintenance Activities including the supply of "incidental materials", and all reporting for a CMA during each monthly period, with the following exceptions:

- Separate payment will be made for any item of Work performed as part of a Scheduled or Reactionary Road Inspection, Emergency Duty, or Routine Highway Maintenance Activity for which a separate contract bid item exists.
- Separate payment will be made for any item of Work for which the Work and payment is specifically covered by a Work Order.
- Separate payment will be made for the actual (without mark-up) landfill disposal fee for disposal of large road kill and litter. In situations where roadkill is disposed of at a landfill site, separate payment will also be made at the unit price bid per kilometre for "Haul of Road Kill". Distance will be measured from the 'home shop' for the applicable maintenance beat to the nearest suitable disposal site as determined by the Engineer, regardless of whether or not the roadkill is hauled directly to the disposal site or to the shop. Payment will be made on a "per trip" basis regardless of the number of animals hauled to the disposal site on any given trip. The maximum number of trips paid for will be outlined in the Special Provisions. Payments for the landfill disposal fee and the haul to the disposal site will be considered full compensation for all costs involved in the disposal of roadkill.
- When the Engineer authorizes the use of heavy equipment/vehicle for the removal and disposal of large roadkill, the additional equipment costs will be paid as Extra Work.
- Separate payment will be made, as Extra Work, for the pick-up and disposal of litter bags resulting from the Annual Highway Clean-up program. If additional equipment is required, it will also be paid for as Extra Work.
- When the Contractor utilizes a private waste disposal company and rented bins for the disposal of garbage, the costs for bin rental and one bin pickup per month (maximum 12 per year) will be considered included in the Highway Maintenance Work item. Additional pickups will be paid for at the actual cost invoiced by the disposal company with no markup. A minimum bin size is listed in the Special Provisions.

No adjustment to the unit price bid per month for "Highway Maintenance Work" will be considered due to any expansion or reduction of the highway network that may occur during the term of the Contract unless the Department deems the expansion or reduction is significant enough that an adjustment is warranted.

53.39.7.2 **Additional Road Inspections**

Payment will be made at the unit price bid per kilometre for "Additional Road Inspections". Payment will be based on the total number of kilometres travelled for each inspection and will be full compensation for all labour, equipment, tools, and incidentals necessary to complete the work. Such

payment will apply for Additional Road Inspections performed both during and outside normal working hours.

#### 53.39.7.3 **After Hours Call-out**

Inspections or “call outs” that are unplanned/unscheduled and outside of normal working hours will be made at the unit price bid per occurrence for "After Hours Call-Out" as established by the Department and shown in the Unit Price Schedule. Such payment will only be made if:

- Response is required outside the normal working hours of 7:00 am to 5:00 pm, Monday to Friday (Excluding Statutory Holidays); and
- The Contractor is not eligible for a premium under a separate category of Work; and
- The Contractor does not receive payment under any bid item other than "Highway Maintenance Work." If the required bid item work is not performed at the time of the call-out, the "After Hours Call-Out" will be paid.

#### 53.39.8 WARRANTY

There is no warranty for Work paid for under the monthly unit price payment for Highway Maintenance Work.

Work paid for under other specifications (i.e. pothole patching) will have the warranty as detailed in the applicable specification.

53.40 NOT USED

## 53.41 MILLED RUMBLE STRIPS

### 53.41.1 GENERAL

This specification covers the construction of milled rumble strips on the shoulders of highways and on the centreline of undivided highways to alert drivers when they leave the travel lanes. Also, this specification includes construction of milled rumble strips across the travel lanes to alert drivers of an upcoming stop condition.

### 53.41.2 EQUIPMENT

The milling machine shall be equipped to meet or exceed the following requirements:

- For milling of shoulder strips, the cutting head shall be capable of producing grooves meeting the requirements as shown on Dwg. No. CB6-3.52M1.
- For milling of rumble strips for stop conditions, the cutting head shall be capable of producing grooves meeting the requirements as shown on Dwg. No. CB6-3.52M3.
- For milling of rumble strips on centreline, the cutting head shall be capable of producing grooves meeting the requirements as show on Dwg. No. CB6-3.25M4.
- The machine shall either be equipped with an integral sweeping device mounted directly behind the cutter or,  
  
a separate sweeping operation shall be conducted as construction of the rumble strips progresses within the signed construction zone.

The Contractor shall supply a truck mounted sequential arrow board in accordance with Specification 53.38, Supply of Arrowboards and Dynamic Message Signs for Traffic Control.

### 53.41.3 PROCEDURE

#### 53.41.3.1 **Construction of Milled Rumble Strips**

For milling of shoulder strips, the Contractor shall construct continuous milled rumble strips as shown on Drawing CB6-3.52M1 - Typical Layout for Continuous Milled Rumble Strips for Shoulders.

When required, the Contractor shall construct milled rumble strips for stop conditions as shown on Drawing CB6-3.52M3 - Typical Layout for Milled Rumble Strips for Stop Conditions. Due to space constraints, it may not be possible to construct all of the strips at some intersections. In these cases, the Contractor shall construct the number of strips as shown in the Work Order or as directed by the Engineer.

When required, the Contractor shall construct milled rumble strips on centreline as shown on Drawing CB6-3.52M4.

No grooving will be done across intersections, tapers, or accesses nor at any other locations specified by the Engineer.

After milling the grooves, the Contractor shall pickup and dispose of all detritus created from the milling operation.

### 53.41.3.2 Acceptance Criteria

The completed milled rumble strips shall be constructed in accordance with the plans, and when measured shall not show any of the following defects:

- Groove length variation of more than 10 mm;
- Groove spacing variation more than 40 mm.

Patterns of milled rumble strips constructed outside the tolerances as shown on the plans or exhibiting any of the above defects will be rejected, and the Contractor shall be responsible for repairing the unacceptable work.

### 53.41.4 TIME TO COMPLETE

The Contractor shall complete the Work within 60 days of the issuance of the Work Order.

### 53.41.5 MEASUREMENT AND PAYMENT

#### 53.41.5.1 Milled Rumble Strips

Measurement of milled rumble strips will be made longitudinally to the nearest 0.001 km of actual milled sections for each side of the road and/or centreline where accepted milled rumble strips have been constructed. Gaps in milled areas such as for intersections, tapers, and accesses will be excluded from measurement and payment.

Payment will be made at the unit price bid per kilometre per side for “Milled Rumble Strips – Shoulder” and per kilometre for “Milled Rumble Strips – Centreline”, as applicable. This payment will be full compensation for constructing the milled rumble strips and removing and disposing of all debris.

#### 53.41.5.2 Milled Rumble Strips for Stop Conditions

Milled rumble strips for stop conditions will be measured by the set as the total of all completed strips at each stop location.

Payment will be made at the unit price bid per set for "Milled Rumble Strips for Stop Conditions". This payment will be full compensation for constructing the milled rumble strips and removing and disposing of all debris.

#### 53.41.5.3 Traffic Accommodation

All traffic accommodation will be supplied as 51.3 Traffic Accommodation and Temporary Signing and if required 53.38, Supply of Arrowboards and Dynamic Message Signs for Traffic Control, and is incidental to the work.

### 53.41.6 WARRANTY

There is no warranty period for this Work.



## ROADSIDE MAINTENANCE

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## 54.1 MOWING AND HAND TRIMMING

### 54.1.1 GENERAL

The Work consists of cutting all vegetation 25 mm or less in diameter, to a height of 150 mm as measured from the ground line. Generally, if slopes are steeper than 3:1, only a 2 metre shoulder cut will be required.

Unless otherwise specified in the Special Provisions, hand trimming of vegetation adjacent to structures which are accessible to the mower shall be performed in conjunction with each occurrence of mowing. Typically, these structures include appurtenances such as sign posts, guide posts, guardrail, utility pedestals and culvert ends.

Hand trimming for areas in-accessible to the mower shall be considered as a separate operation and will be paid for separately. Typically these areas will include sections with erosion control devices, overpass embankments and ramps, and other steep slopes.

Portions of the Work may be deleted to accommodate hay cutting permits issued to others.

### 54.1.2 EQUIPMENT

Tractors shall be equipped with roll over protection canopies, seat belts and four way flashers or a rotating light. Mowers shall be equipped to prevent debris from being thrown from the mower blades. Mowers shall also be equipped with 330 mm x 410 red flags mounted 450 mm above the deck height, marking the outer edges of the mower. Hand tools or hand held motorized equipment may be required for trimming.

### 54.1.3 PROCEDURE

The mower shall travel in the direction of traffic when any part of the equipment is on the roadway surface, and when performing the first pass adjacent to the highway unless otherwise approved by the Engineer.

Mowing and trimming shall be performed such that the resulting stand of growth does not exceed 150 mm in height and in a manner which minimizes debris from being deposited on the roadway surface.

In the event the Engineer specifies that trimming is not required, mowing in the area of structures shall be performed such that the cut is within:

- 1.5 metres of the structure in the direction of travel of the mower
- 0.3 metres of the structure perpendicular to the direction of travel of the mower.

Contractor shall ensure that his activities do not cause rutting in the highway right of way or damage erosion control sites and reclamation sites.

The Contractor may bale or otherwise salvage mowed material and retain possession of the material. Salvaged material shall be placed in a manner which will not create a hazard to traffic and shall be removed within two weeks of being produced.

The Contractor is responsible to check with the appropriate local authorities (Counties, Municipal Districts, Improvement districts, Towns, Villages and Special Areas), Alberta Infrastructure and Transportation, Alberta Agriculture, Food and Rural Development and adjoining landowners to identify any areas which have been treated with herbicides or pesticides.

#### 54.1.4 HAY AND “NO SPRAY” PERMITS

The Contractor will administer the application process for Hay and “No Spray” permits on behalf of Alberta Transportation. The Contractor will perform the following tasks as part of the administration process.

- Through public media, advertise the start and end date for submitting hay permit applications and the conditions and requirements for qualification.
- Contact the previous year’s permit holders prior to the start date, inviting them to submit re-applications prior the start date. Re-applications do not need to be processed prior to the start date, but can be submitted prior.
- Issue permits on first-come first serve basis and provide copies of completed permits to MCI’s on a weekly basis. Landowners will get first preference to those areas adjacent to their properties.
- Track and record location and length of area assigned to permit holder. Ensure fair and equitable distribution of permits.
- Ensure permit holder is following the permit.
- Contact permit holder if permit is not being adhered to.
- Supply and install "No Spray Zone" signing for no spray areas
- Submit a year end summary of permits to Alberta Transportation by September 1 annually.

#### 54.1.5 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 5 calendar days of the issuance of the Work Order. In all other cases the Work shall be completed within 45 calendar days of the issuance of the Work Order.

#### 54.1.6 MEASUREMENT AND PAYMENT

##### 54.1.6.1 **General**

Measurement will be in hectares based on the area of the surface mowed. Separate measurement of areas trimmed will not be made.

Payment will be made at the unit price bid per hectare for "Mowing". This payment will be full compensation for all labour, equipment, tools and incidentals necessary to complete the Work. Hand trimming adjacent to structures which are accessible to the mower will be considered incidental to the Work and will not be paid for separately.

Hand trimming in areas in-accessible to the mower shall be paid for at the unit prices bid per hour for "Supply of Labourer (Miscellaneous Work)" and "Supply of Truck (Miscellaneous Work)" in accordance with Specification 55.6, Supply of Labour and Trucks for Miscellaneous Work.

In urgent situations where the Contractor is required to complete the Work within 5 calendar days of the issuance of the Work Order, and the completion of the Work involves mobilizing men and equipment from an existing project or worksite, the cost of mobilizing and returning the men and equipment to the original project or worksite will be paid for as Extra Work in accordance with Specification 51.2, General (for Maintenance Work).

No payment will be made for areas mowed by others.

Payment for administration of permits will be made at the unit price bid for “Administer Hay and No Spray Permits” and shall be full compensation for all work required including supply and installation of No Spray Zone signs. Individual payment will be made for each permit administered.

54.1.7 WARRANTY

There is no warranty period for this Work.



## 54.2 HAND BRUSHING

### 54.2.1 GENERAL

The Work consists of cutting, stacking and/or disposing of standing or fallen brush and trees using hand held tools or equipment. This Work also includes the disposal of the limbs and other debris.

### 54.2.2 EQUIPMENT

The Contractor shall supply all equipment necessary to complete the work. Typical equipment required includes a vehicle, chainsaws, axes, brushhooks and brushcutters. The size and type of the equipment to be supplied will be subject to the approval of the Engineer.

### 54.2.3 LABOUR

The Contractor shall supply a minimum 2-man crew. The number of 2-man crews required will be specified on the Work Order.

### 54.2.4 PROCEDURE

The Contractor shall prevent debris from being deposited on the roadway surface, water courses or adjacent lands. Work shall be performed during daylight hours only, unless otherwise approved by the Engineer. Cleared material over 100 mm in diameter shall be cut into 500 mm lengths and stacked along the edge of the Right-of-Way. The Contractor shall dispose of material less than 100 mm in diameter.

Trees and brush shall be hand brushed to a height not exceeding 150 mm. Stumps larger than 25 mm diameter shall be cut at ground level. Tops of stumps shall not be left cone shaped or pointed.

The Contractor shall ensure that drainage structures are not damaged or obstructed by hand brushing operations.

### 54.2.5 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 5 calendar days of the issuance of the Work Order. In all other cases the Work shall be completed within 30 calendar days of the issuance of the Work Order.

### 54.2.6 ACCEPTANCE CRITERIA

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

- All cleared material over 100mm in diameter is cut into 500 mm lengths and stacked along the edge of the right-of-way.
- All materials less than 100 mm in diameter are disposed of.
- Trees and brush are hand brushed to a height not exceeding 150 mm.
- Stumps larger than 25 mm in diameter are cut at ground level.
- No stumps are left cone shaped or pointed.
- Work site is left in a clean state.

#### 54.2.7 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest ¼ hour) for the time each 2 person crew spends travelling to and from the worksite, and is engaged in the Work. The maximum allowable travel time will be one hour from the worksite to the nearest shop or one hour between worksites.

Payment will be made at the unit price bid per hour for “Hand Brushing (2 person crew)” and will be full compensation for all labour, equipment, tools and incidentals necessary to complete the Work, including traffic accommodation and signing.

#### 54.2.8 PERMITS AND APPROVALS

The Contractor shall be responsible for obtaining any permits and approvals required for the supply of water and disposal of dirt and debris prior to commencement of the Work.

##### 54.2.8.1 **DFO - Alberta Operational Statement**

The Contractor shall meet all requirements stated in the Department of Fisheries and Oceans’ (DFO) document titled “Alberta Operational Statement, Habitat Management Program, Bridge Maintenance”. The most current version of this document shall govern.

A copy of this document can be obtained from the following web site:

<http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territoires-territoires/ab/index-eng.htm>

**54.3 NOT USED**

## 54.4 CHEMICAL VEGETATION CONTROL

### 54.4.1 GENERAL

The Work consists of controlling weeds, grass, brush and small trees up to 2 m in height through the use of chemicals. The Work involves spraying with mobile equipment over relatively large areas and spot or hand spraying of small areas or areas which would normally be inaccessible to mobile equipment.

### 54.4.2 MATERIALS

The Contractor shall select and supply the appropriate chemical for vegetation control. Only chemicals approved by the appropriate department of the Federal government for general industrial spraying shall be used. The Contractor shall supply any signs required to identify treated areas in public use areas.

The Contractor shall select and supply an appropriate dye to add to the chemicals, to visibly mark treated areas.

### 54.4.3 OPERATING STANDARDS, APPROVALS AND PERMITS

The Contractor shall comply with the operating standards and practices of the Industrial Vegetation Management Association of Alberta and shall have a service approval agreement from Alberta Environment. All personnel applying chemicals shall have a valid applicators license issued by Alberta Environment.

Special Use Approvals issued by Alberta Environment will be required in instances where chemicals are to be sprayed within 30 m of an open body of water. In such instances, the Contractor shall advertise the proposed work in newspapers local to the area, 30 days prior to the scheduled starting date of the Work. The Contractor shall provide the Engineer with a copy of the newspapers containing the advertisement. All public concerns shall be referred, by the Contractor, to Alberta Environment who will identify any work conditions in the approval. The Contractor shall be responsible for obtaining the Special Use Approval and shall comply with the conditions specified therein.

### 54.4.4 PROCEDURES

The Contractor's use of chemicals, application rates and methods shall comply with the policies, rules and regulations of Alberta Environment.

The Contractor shall maintain accurate records of all applications including the type and amounts of chemicals used and the locations treated. The Contractor shall supply this information to the Engineer along with copies of the bills of lading and the manufacturer's recommended application rates for the chemicals used.

The Contractor shall apply chemicals to specified areas only and shall dispose of empty chemical containers at approved disposal sites.

The Contractor shall mix the dye with the chemical at the manufacturer's recommended rates.

### 54.4.5 METHODS OF APPLICATION

Areas of application will be defined as:

#### 54.4.5.1 **Mobile Spray - On Road**

Continuous treatment areas with a minimum width of 1.5 m which:

- consist of at least 3 ha in 20 km of roadway length in not more than two individual areas (areas that cannot be sprayed due to landowner objections, environmental concerns, et cetera are not considered breaks in continuous areas)
- are adjacent to and extend up to 14 m from the shoulder edge, and
- are of a constant width. (full right-of-way is considered a constant width even though the right-of-way may vary)

#### 54.4.5.2 **Mobile Spray - Off Road**

Continuous treatment areas which:

- consist of at least 3 ha in 20 km of roadway length in not more than two individual areas (areas that cannot be sprayed due to landowner objections, environmental concerns, et cetera are not considered breaks in continuous areas)
- are outside of 14 m from the shoulder edge,
- are of a constant width. (up to the right-of-way is considered a constant width even though the right-of-way may vary and
- are mobile accessible and for which it is desirable to utilize off-road equipment.

#### 54.4.5.3 **Mobile Spot Spray - On-Road**

All areas not defined as "Mobile Spray- On Road", "Mobile Spray - Off Road", "Mobile Spot Spray - Off-Road" or "Hand Spray".

#### 54.4.5.4 **Mobile Spot Spray - Off-Road**

Intermittent areas within the right-of-way, outside of 14 m from the shoulder edge which are mobile accessible and for which it is desirable to utilize off-road equipment. For example: certain slopes, fence lines, property lines, overpasses and interchanges.

#### 54.4.5.5 **Hand Spray**

All small select areas not accessible to any type of mobile equipment. A hose connected to the mobile unit may be used for hand spraying when practical to do so.

#### 54.4.6 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 5 calendar days of the issuance of the Work Order. In all other cases, the Work shall be completed within 15 calendar days of the issuance of the Work Order.

#### 54.4.7 ACCEPTANCE CRITERIA

The Work will be considered acceptable under the following conditions:

- All specified areas have been visibly treated and at least 75% of the vegetation shows growth retardation 10 days after spraying.
- At least 90% of the vegetation shows growth retardation 40 days after spraying.
- No areas outside the specified areas show chemical damage.
- The Contractor has provided the Engineer with accurate records of the locations treated and the types and amounts of chemicals used.

#### 54.4.8 MEASUREMENT AND PAYMENT

##### 54.4.8.1 **General**

Measurement of chemical vegetation control will be in hectares or square metres depending on the method of application. Areas will be measured and paid for only once per Work Order regardless of the number of times the area is treated. The minimum width used for calculating the area for Vegetation Control - Mobile Spray will be 1.5 metres.

When the Engineer determines that a pilot vehicle and/or arrowboard is required for traffic accommodation the pilot vehicle will be paid for as Extra Work in accordance with Specification 51.2, General (for Maintenance Work) and the arrowboard will be paid for in accordance with Specification 53.38, Supply of Arrowboards for Traffic Control.

##### 54.4.8.2 **Mobile Spray - On-Road**

Payment for chemical vegetation control using on-road, mobile equipment will be made at the unit price bid per hectare for "Vegetation Control - Mobile Spray - On-Road". This payment will be full compensation for obtaining all necessary approvals and permits, spraying the vegetation using on-road, mobile equipment, and all labour, equipment, tools and incidentals necessary to complete the Work.

##### 54.4.8.3 **Mobile Spray - Off-Road**

Payment for chemical vegetation control using off-road, mobile equipment will be made at the unit price bid per hectare for "Vegetation Control - Mobile Spray - Off-Road". This payment will be full compensation for obtaining all necessary approvals and permits, spraying the vegetation using off-road mobile equipment, and all labour, equipment, tools and incidentals necessary to complete the Work.

##### 54.4.8.4 **Mobile Spot Spray - On-Road**

Payment for spot chemical vegetation control using on-road, mobile equipment will be made at the unit price bid per hectare for "Vegetation Control - Mobile Spot Spray - On-Road." This payment will be full compensation for obtaining all necessary approvals and permits, spraying the vegetation using on-road, mobile equipment, and all labour, equipment, tools and incidentals necessary to complete the Work.

##### 54.4.8.5 **Mobile Spot Spray - Off-Road**

Payment for spot chemical vegetation control using off-road, mobile equipment will be made at the unit price bid per hectare for "Vegetation Control - Mobile Spot Spray - Off-Road." This payment will be full compensation for obtaining all necessary approvals and permits, spraying the vegetation using off-road, mobile equipment, and all labour, equipment, tools and incidentals necessary to complete the Work.

##### 54.4.8.6 **Hand Spray**

Payment for spot vegetation control using hand equipment will be made at the unit price bid per square metre for "Vegetation Control - Hand Spray." This payment will be full compensation for obtaining all necessary approvals and permits, hand spraying the vegetation, and all labour, equipment, tools and incidentals necessary to complete the Work.

##### 54.4.8.7 **Scheduling Premiums**

In urgent situations where the Contractor is required to complete the Work within 5 days of the issuance of the Work Order, an additional payment will be made at the applicable unit price bid per occurrence for

"Mobile Spray - Premium" or "Hand Spray - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete of the Work.

#### 54.4.8.8 **Chemicals and Dye**

Payment for the supply of chemicals and dye will be made as "Extra Work" in accordance with Specification 51.2, General for Maintenance Work. The Engineer will review the bills of lading, transportation of dangerous goods information, the manufacturer's recommended application rates, and production reports supplied by the Contractor to determine quantities.

No payment will be made for materials used for any additional applications required to achieve compliance with the Acceptance Criteria.

#### 54.4.9 WARRANTY

There is no warranty period for this Work.

## 54.5 STEAMING CULVERTS

### 54.5.1 GENERAL

This Work consists of removing ice blockages from inside culverts and around culvert inverts.

### 54.5.2 EQUIPMENT

The Contractor shall supply the following type of equipment:

- High pressure water steamer capable of delivering hot water at a minimum capacity of 1050 l/h, while operating at a minimum operating pressure of 20 Mpa. The nozzle shall have an input rating of not less than 420,000 kJ/h.
- A water tank with a minimum capacity of 900 litres.
- A minimum of 50 m long steaming pipe to reach the entire length of the culvert.
- The steaming unit shall be equipped with a hose of at least 100 m long.

### 54.5.3 PROCEDURES

Generally, the Contractor shall commence steaming at the downstream end of the culvert and continue until drainage has been achieved.

### 54.5.4 ACCEPTANCE CRITERIA

To be acceptable, this Work shall be performed such that backed up water drains without causing damage to any private or public property. The culvert shall be clear and there shall be no damage at the downstream end as a result of "opening" the culvert too quickly.

### 54.5.5 RESPONSE TIME

In an urgent situation the Contractor shall respond within 2 hours of the issuance of the Work Order. In all other case, the contractor shall respond within 24 hours of the issuance of the Work Order.

### 54.5.6 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest 1/4 hour) for the time spent travelling to and from the worksite, travelling between worksites and engaged in the Work in accordance with the following:

- the maximum allowable travel time from the nearest shop to the worksite will be one hour
- the maximum allowable travel time from the worksite to the nearest shop will be one hour
- travel time between worksites will be based on the shortest distance between sites
- travel time shall be reported separately on a daily crew worksheet
- two 15 minute coffee breaks per day will be allowed (no deduction)

Payment will be made at the unit price bid per hour for "Steaming Culverts". This payment will be full compensation for travel time, steaming the culvert, steaming ice blockages at the culvert inverts, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

Payment will not be made for downtime for repair, refuelling or maintenance of equipment nor for the time spent hauling replacement equipment to the worksite.

### 54.5.7 WARRANTY

There is no warranty period for this Work.



## 54.6 CLEANING DEBRIS FROM CULVERTS

### 54.6.1 GENERAL

The Work consists of removing silt or debris from culvert barrels and culvert sloped end sections to restore proper drainage. The culvert barrel is the portion of the culvert excluding the sloped ends.

### 54.6.2 EQUIPMENT

The Contractor shall supply all equipment necessary to complete the Work.

Siltation is removed by a water or a vacuum truck which are not considered as specialized equipment.

### 54.6.3 PROCEDURES

#### 54.6.3.1 **Cleaning Culvert Barrels**

The Contractor shall remove and dispose of material from the culvert barrel. When the debris blockage has been removed from the culvert barrel, the entire culvert, including the culvert inverts, shall be free of debris, allowing a normal flow of water. Debris is defined as beaver dams, wood, vegetative material, household items and other non-granular materials. Silt is not considered as debris under this specification.

If the culvert is blocked by silt, rock, or other granular material, the Engineer and the Contractor will determine the appropriate action including any specialized equipment required for cleaning the culvert.

In the event the culvert immediately drains into live body of water, additional sediment controls may be required, as determined by the engineer.

#### 54.6.3.2 **Cleaning Sloped Ends**

The Contractor shall remove and dispose of material from the culvert ends to restore normal water flow. This will require 1 person with hand tools for a period of up to 1 man-hour of labour.

If the culvert end is blocked by silt, rock or other granular material requiring more than 1 man-hour of labour, the Engineer and the Contractor will determine the appropriate action and the specialized equipment required for cleaning the culvert ends.

### 54.6.4 ACCEPTANCE CRITERIA

The culvert barrel and/or culvert ends shall be free of debris and silt, rock or granular material, allowing a normal flow of water as determined by the Engineer.

### 54.6.5 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 2 calendar days of the issuance of the Work Order. In all other cases, the Work shall be completed within 30 calendar days of the issuance of the Work Order.

#### 54.6.6 MEASUREMENT AND PAYMENT

##### 54.6.6.1 **Culvert Barrels**

Measurement will be made in metres of the full length of culvert barrel , for a specific range of diameters, regardless of the size or length of blockage.

Payment will be made at the applicable unit price bid per metre for "Cleaning Culvert Barrel - up to 800 mm diameter," or "Cleaning Culvert Barrel - over 800 mm and less than 1500 mm diameter" and "Cleaning Culvert Barrel - 1500 mm and over". This payment will be full compensation for removing and disposing of debris from the culvert barrel, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

When debris is cleaned from the culvert barrel, removing and disposing of that debris from the sloped ends shall be incidental to the Work.

Payment for specialized equipment, if required, and as determined by the Engineer and the Contractor, will be paid as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

##### 54.6.6.2 **Sloped Ends**

Measurement will be made of the number of sloped ends cleaned, regardless of the diameter of the pipe.

Payment will be made at the unit price bid per sloped end for "Cleaning Culvert Ends". This payment will be full compensation for removing and disposing of debris from the culvert end, and all labour, material, equipment, tools and incidentals necessary to complete the Work.

If the time required for cleaning a culvert end is 10 minutes or less, the Work will be considered a Routine Highway Maintenance Activity as defined in Specification 53.39, Highway Maintenance Work and no separate or additional payment will be made.

Payment for specialized equipment, if required, and as determined by the Engineer and the Contractor will be paid as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

##### 54.6.6.3 **Reduced Time to Complete**

In urgent situations where the Contractor is required to complete the Work within 2 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Culvert Cleaning - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

#### 54.6.7 WARRANTY

There is no warranty period for this Work.

**54.7 NOT USED**

## 54.8 REMOVAL OF CULVERTS

### 54.8.1 GENERAL

The Work consists of removing existing culverts (less than 1500 mm in diameter), from roadways and approaches and disposing of the culvert material.

### 54.8.2 MATERIALS

All culvert materials removed shall become the property of the Contractor.

### 54.8.3 PROCEDURES

When removal and disposal of existing culverts is required, the Contractor shall dispose of the culvert material at a suitable location. Disposal of culvert material within the right-of-way will not be permitted.

### 54.8.4 ACCEPTANCE CRITERIA

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

- there is no settlement of the area backfilled,
- the culvert is properly disposed of, and
- the surrounding ditch/area is landscaped to the satisfaction of the Engineer.

### 54.8.5 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 14 calendar days of the issuance of the Work Order. In all other cases, the Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

### 54.8.6 MEASUREMENT AND PAYMENT

#### 54.8.7 Removal and Disposal of Culverts

Measurement will be made in metres of the total length of pipe removed, including sloped ends.

Payment will be made at the unit price bid per metre for "Culverts - Remove and Dispose". This payment will be full compensation for the removal and disposal of the culvert material, and all labour, equipment, tools and incidentals necessary to complete the Work.

When required, the Contractor shall supply granular material in accordance with Specification 55.4, Supply of Aggregate and Specification 55.3, Aggregate Production and Stockpiling, for the designation and class of material specified and asphalt concrete pavement material in accordance with Specification 53.11, Production of Asphalt Concrete Pavement Material.

#### 54.8.8 Excavation for Removal of Culverts

Measurement will be made in cubic metres of the volume of the excavation required to remove the culvert (less the volume of the culvert).

Payment will be made at the unit price bid per cubic metre for "Culverts - Excavation and Backfill". This payment will be full compensation for excavating and salvaging or disposing of the excavated materials and backfilling the new culvert or excavation with salvaged or new material. If new material is required

for backfill, the Contractor shall supply such material suitable to the Engineer. Payment for the supply, place and haul of new backfill material (Non granular material such as clay materials which is not covered under any bid item) if required will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

#### 54.8.8.1 **Reduced Time to Complete**

In urgent situations where the Contractor is required to complete the Work within 14 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Culvert Removal - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work. If the culvert removal is performed in conjunction with the installation of a new culvert under Specification 54.9, Supply and Installation of Culverts, only one of the "premium" payments will be paid. (Culvert Installation - Premium or Culvert Removal - Premium)

#### 54.8.8.2 **Traffic Control for Centreline Culverts**

When a highway centre-line culvert is removed, a supplemental payment will be made at the unit price bid per metre of pipe removed for "Centre-line Culvert - Traffic Control". This payment will be full compensation for the additional traffic control involved in removing the culvert.

#### 54.8.9 WARRANTY

There is no warranty period for this Work.

## 54.9 SUPPLY AND INSTALLATION OF CULVERTS

### 54.9.1 GENERAL

The Work consists of excavating existing material to proper elevation and installing new or salvaged culverts less than 1500 mm in diameter of various sizes and types, including preparing the culvert base and placing granular and/or soil backfill.

### 54.9.2 MATERIALS

When installing new culverts, the Contractor shall supply the new culvert material in accordance with the Alberta Transportation Products list. The Engineer will determine the type, size, wall thickness and required coatings for the culvert and will indicate this information on the Work Order.

When required, the Contractor shall supply granular material in accordance with Specification 55.4, Supply of Aggregate and Specification 55.3, Aggregate Production and Stockpiling, for the designation and class of material specified and asphalt concrete pavement material in accordance with Specification 53.11, Production of Asphalt Concrete Pavement Material.

### 54.9.3 PROCEDURES

#### 54.9.3.1 **Excavation and Preparation of Base**

Excavation for the culvert base shall be to a depth of not less than 0.3 m below the culvert invert elevation, as established by the Engineer, and shall be of sufficient width to permit assembly of the pipe and the operation of compaction equipment on either side of the pipe. All soft, yielding, or unsuitable material at this level shall be removed to a depth as directed by the Engineer and replaced with granular or other acceptable material to provide a firm foundation of uniform density throughout the entire length of the pipe.

On completion of excavation for the culvert base and the removal and replacement of any soft, yielding or unsuitable material, the Contractor shall compact the exposed surface to a uniform density. The Contractor shall then construct and thoroughly compact the culvert bed to the established elevation using granular or other material acceptable to the Engineer. The width of the culvert bed shall be 3 times the culvert diameter.

When the culvert installation is in rock, excavation for the culvert base shall be carried out to a depth of not less than 0.2 m below the invert grade. The width of the culvert bed shall be a minimum of 1.5 times the diameter of the pipe.

Where gravel bedding or backfill is used, impervious, compacted clay cut-offs shall be constructed at both ends of the culvert as shown in drawing CB6-2.4 M1.

#### 54.9.3.2 **Installation**

##### 54.9.3.2.1 General

The culvert shall be installed on the prepared base, true to the elevations lines and grades established by the Engineer. Separate sections shall be securely joined together in accordance with the manufacturer's specifications. Coupler bands shall be used for metal and polyethylene pipe.

The Contractor shall use due care when installing pipe to avoid damaging the pipe. Damaged pipe shall be removed and replaced by the Contractor at his expense.

#### 54.9.3.2.2 Installation of Corrugated Metal Pipe and Pipe Arches

When required, elbows shall be installed to accommodate sharp changes in gradient or direction of the pipe. Pipe shall be carefully handled to prevent damage to the protective coating. Any damage to coatings shall be repaired by the Contractor at his own expense in accordance with CAN 3-G401.

#### 54.9.3.2.3 Installation of Corrugated Polyethylene Pipe

Using a template, the Contractor shall shape the culvert bed to the curvature of the pipe to a depth of 75 mm.

Blocking shall not be used to bring the pipe to grade. Temporary hold-downs shall be used to maintain the position of the pipe during installation.

Sections of pipe with a minimum length of 6 m shall be used on each end of each culvert.

#### 54.9.3.2.4 Installation of Downdrains

When required, downdrain pipes shall be installed as shown in the drawings, at the locations as shown on the plans or designated by the Engineer. A trench shall be excavated to the established depth and grade required for the installation of the downdrain pipe and connecting elbows, and its bottom surface shall provide a uniform, firm foundation throughout the length of the installation, with sufficient width to permit satisfactory jointing and thorough compaction of the backfill material around the pipe.

#### 54.9.3.2.5 Extension of Existing Culverts

Extensions to existing culverts will be considered new installations. Where an existing culvert is to be extended, the removal, salvage and reinstallation of the existing sloped end sections may be required, as shown in the drawings or as directed by the Engineer.

Where the existing pipe was manufactured to imperial dimensions and the new pipe is manufactured to metric dimensions resulting in a mismatch at the joint, the Contractor shall couple and caulk the joint with oakum to obtain a secure joint.

### 54.9.3.3 **Backfilling**

#### 54.9.3.3.1 General

Backfill under the haunches and immediately adjacent to the pipe, extending from the culvert base up to an elevation of 30 percent of the vertical height of the pipe, shall be comprised of select granular or soil material, as directed by the Engineer. Backfill immediately adjacent to the pipe above this level shall be comprised of select soil material. All backfill material shall be free of frozen lumps and organic material. Backfill within 300 mm of the pipe wall shall be free of stones larger than 80 mm in diameter.

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 pipe, 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 if necessary to carry the weight of construction equipment without damage to the pipe.

Backfilling of the remainder of the culvert excavation, beyond the immediate region of the pipe, shall be carried out in accordance with applicable specifications.

#### 54.9.3.3.2 Backfilling Corrugated Polyethylene Pipe

The minimum height of fill above the top of the pipe shall be 0.6 m.

When saw cutting of sloped ends is required by the Engineer, it shall be performed immediately after backfill is completed.

#### 54.9.4 ACCEPTANCE CRITERIA

To be acceptable, the Work shall comply with the following:

- The contractor shall install the culvert to proper elevations that allows positive drainage and without ponding and erosion on both ends of the culvert.
- The surface is left at design slope, with no excess spoil. The work area is cleaned up to remove obstructions and prevent erosion damage.
- Backfill is properly compacted so that there will be no significant settling.
- Surplus pieces of culvert are removed from the worksite.

#### 54.9.5 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 14 calendar days of the issuance of the Work Order. In all other cases, the Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 54.9.6 MEASUREMENT AND PAYMENT

##### 54.9.6.1 **Supply and Installation of Culverts**

Measurement will be made in metres of the total length of pipe installed, including elbows and end sections.

Payment will be made at the applicable unit price bid per metre for "Culverts - Install" for the various sizes of culverts specified. This payment will be full compensation for installing the type of pipe required by the Engineer, and all labour, equipment, tools and incidentals necessary to complete the Work.

Payment for supplying the culvert pipe will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

##### 54.9.6.2 **Excavation and Backfill for Installation of Culverts**

Measurement will be in cubic metres of the volume of the excavation required to install the culvert. If an existing culvert is being removed, the volume of the existing pipe will be subtracted from the volume of the excavation.

Payment will be made at the unit price bid per cubic metre for "Culverts - Excavation and Backfill". This payment will be full compensation for excavating to the extent necessary to install the culvert, salvaging or disposing of the excavated material and backfilling the installed culvert with salvaged or new material.

If new material (Non-Granular) is required for backfill, the Contractor shall supply such material suitable to the Engineer. Payment for the supply, place and haul of new backfill material (Non -Granular) will be made as Extra Work in accordance with specification 51.2 General (For Maintenance Work).



#### 54.9.6.3 **Culverts For Major Roadways**

Culverts across primary highways and major intersecting roadways require a culvert base, clay cut-offs and structural backfill. Payment for the culvert base and structural backfill will be made in accordance with Specification 53.2, Pit-Run, or Specification 53.3, Granular Base Course. Asphalt concrete pavement material required to restore the structure shall be supplied and paid for in accordance with Specification 53.13, Asphalt Pavement Surface Patching.

#### 54.9.6.4 **Reduced Time to Complete**

In urgent situations where the Contractor is required to complete the Work within 14 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Culvert Installation - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work. If the culvert installation is performed in conjunction with the removal of a culvert under Specification 54.8, Removal of Culverts, only one of the "premium" payments will be paid. (Culvert Installation - Premium or Culvert Removal - Premium)

#### 54.9.6.5 **Traffic Control for Centreline Culverts**

When a highway centreline culvert is installed, a supplemental payment will be made at the unit price per metre of pipe installed for "Centreline Culvert - Traffic Control". This payment will be a full compensation for the additional traffic control involved to install the culvert.

#### 54.9.7 **WARRANTY**

The warranty period for this Work shall be 1 year. If, during the warranty period, the backfilled area has settlement to the extent that it becomes a hazard to the public, the Work shall be repaired.

## 54.10 REPAIR CULVERT ENDS

### 54.10.1 GENERAL

The Work consists of excavating material from the culvert end to allow reconnection or realignment of the culvert end, or reconstruction of the culvert bed and replacement of the rip-rap, or bending, cutting or otherwise reshaping the exposed culvert material to reinstate, as much as possible, the original shape.

### 54.10.2 MATERIALS

The Contractor shall supply oakum, couplers, additional rip-rap when necessary.

### 54.10.3 EQUIPMENT

The extent of the repair work required for each pipe will dictate whether hand tools or larger equipment are necessary. Power cutting tools are considered as hand tools and shall be supplied when required.

### 54.10.4 PROCEDURES

Existing rip-rap material shall be removed and salvaged where applicable.

When the pipe end is distorted and no excavation is required, the culvert end can be reshaped to its original intended shape, by the use of hand tools.

When the repair to the culvert end requires reconnecting and/or realigning of the culvert end and/or reconstruction of the culvert bed and/or replacement of the existing rip-rap, excavation may be required. Reshaping of the pipe end may also be required as part of this Work.

Oakum may be required to provide a seal when reconnecting a culvert end.

### 54.10.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, culvert ends must be properly connected, aligned and shaped. Rip-rap shall be reinstalled to the satisfaction of the Engineer and the culvert end shall allow normal drainage.

### 54.10.6 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

### 54.10.7 MEASUREMENT AND PAYMENT

Separate measurement will be made of the number of culvert ends repaired by hand tools and of the number of culvert ends repaired by equipment.

Payment will be made at the unit price bid per culvert end for "Culvert End Repair - Using Hand Tools". This payment will be full compensation for reshaping the culvert end, and all labour, hand tools and incidentals necessary to complete the Work.

Payment will be made at the unit price bid per culvert end for "Culvert End Repair - Using Equipment". This payment will be full compensation for removing, salvaging and reinstalling rip-rap where applicable, excavating around the culvert end, rebuilding the culvert bed as required, reshaping the culvert end, realigning and reattaching the culvert end as required, and all labour, equipment, tools and incidentals necessary to complete the Work.

Payment for couplers, oakum and additional rip-rap, when required will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

54.10.8 WARRANTY

There is no warranty period for this Work.

**54.11 NOT USED**

## 54.12 SUPPLY OF PERMANENT HIGHWAY SIGNS

### 54.12.1 GENERAL

The Work consists of supplying highway signs to the worksite.

### 54.12.2 MATERIALS

All materials supplied by the Contractor shall be in accordance with the Alberta Transportation Products list. The Contractor is responsible for ensuring that the material provided meets the specified characteristics.

The Contractor shall supply all signs in accordance with the Schedule of Signs, or as specified by the Engineer.

For the purpose of this specification, the type of sign supplied shall be defined as "Standard" or "Non-Standard". Signs manufactured on 2 mm flat tension levelled aluminum backing are considered Standard Signs. Signs manufactured on 3/4" plywood or extruded aluminum are considered Non-Standard Signs.

The Contractor shall ensure that all signs are marked with the name of the manufacturer and the date of manufacture.

#### 54.12.2.1 **Specialized Reflective Sheeting for Select Permanent Highway Signs**

For installations of the following signs:

- RA-1 "Stop",
- RA-2 "Yield",
- RB-22 "Wrong Way"
- RB-23 "Do Not Enter"
  
- Overhead Guide Signs without sign illumination
- The following high priority warning signs also require Specialized Reflective Sheeting:
  - Roadway alignment warning signs – curve signs (WA-1, WA-2, WA-3, WA-4, WA-5, WA-6) and chevrons (WA-9).
  - Traffic control ahead signs – stop ahead (WB-1), yield ahead (WB-2), two-way traffic ahead (WB-3), signals ahead (WB-4), prepare to stop AAWS (WB-5), railway crossing ahead (WB-6), school bus stop ahead (WC-9).
  - Hazard signs – hazard board (WA-36) and clearance signs (WA-26, WA-27).
  - Pedestrian signs – pedestrian crossing ahead (WC-2), playground ahead (WC-3).

The reflective sheeting shall meet or exceed the minimum requirements as specified in the ASTM-4956, Performance Requirements Type IX or Type XI Unmetalized Cube Corner Microprismatic Retroreflective Element Material.

For installation of standard regulatory signs and Overhead Guide Signs with sign illumination, the reflective sheeting shall meet or exceed the minimum requirements as specified in ASTM-4956, Performance Requirements Type III or IV, High Intensity Retroreflective Sheeting.

### 54.12.3 PROCEDURE

The Engineer will specify the type of sign required including:

- Dimensions of the sign

- Dimensions of the lettering
- Colours of the sign

When requested by the Engineer, the Contractor shall provide a shop drawing of the layout of a non-standard sign for review and acceptance by the Engineer prior to manufacturing the sign.

#### 54.12.4 TIME TO COMPLETE

This Work shall be completed in conjunction with the installation of the sign and the supply and installation of the sign post where applicable.

All signs shall be supplied in sufficient time to meet the installation requirements as shown in Specification 54.13, Maintenance of Highway Signs.

#### 54.12.5 ACCEPTANCE CRITERIA

The Work will be accepted when the materials conform to the following requirements:

##### 54.12.5.1 **Sheeting Material**

Lettering and symbols shall be clear and legible and of the required retro-reflectivity. The sheeting shall be applied free of blistering, delaminations, peeling or chipping, with no discolouration or fading.

##### 54.12.5.2 **Backing (Substrate)**

###### 54.12.5.2.1 Plywood – Sanded one side

- ½” 100/100 or 120/120 Hi-Density
- ¾” 100/100 or 120/120 Hi-Density

###### 54.12.5.2.2 Aluminum

- “Extruded aluminum panels for major signs, shall be Alcan shape # 73247 with anodize treatment and shall conform to ASTM B221M, “Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes”, Alloys 6061-T6 or 6063-T5
- Aluminum for standard signs shall be a minimum of 2 mm flat sheet tension leveled, sign grade aluminum and shall conform to the requirements of ASTM B209M, “Specification for Aluminum and Aluminum-Alloy Sheet and Plate”, Alloys 6061-T6 or 5052-H38.”

#### 54.12.6 MEASUREMENT AND PAYMENT

##### 54.12.6.1 **General**

Measurement for supplying signs will be made in square metres of the actual surface area of each sign of the applicable type and category. The actual area calculations for the various types and sizes of signs are as shown on the Department’s website.

When a sign contains more than "one print", measurement will also be made of the number of extra ink prints required to manufacture the completed sign. A two colour sign is considered to be one print; that is, the background colour plus a one colour message. A three colour sign requires two printings and a four colour sign requires three printings.

#### 54.12.6.2 Supply of Standard Signs

Bid items for Standard Signs will be categorized according to sheeting type. Payment will be made at the unit price bid per square metre (actual area) for a one print sign under the applicable category as follows:

- Standard Signs - Supply
- Standard Signs (Specialized Reflective Sheeting, Types III and IV) - Supply
- Standard Signs (Specialized Reflective Sheeting, Types IX and XI) - Supply

Payments will be full compensation for supplying the one-print signs to the worksite, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

When extra prints are required, they will be paid for at the unit price bid per print for "Extra Prints." This payment will be full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.12.6.3 Non-Standard Signs

Payment for Non-Standard Signs will be made at the applicable unit price bid per square metre for:

- Non-Standard Signs, 3/4" Plywood - Supply
- Non-Standard Signs, 3/4" Plywood (Specialized Reflective Sheeting, Types III and IV) - Supply
- Non-Standard Signs, 3/4" Plywood (Specialized Reflective Sheeting, Types IX and XI) - Supply
  
- Non-Standard Signs, Extruded Aluminum - Supply
- Non-Standard Signs, Extruded Aluminum (Specialized Reflective Sheeting, Types III and IV) - Supply
- Non-Standard Signs, Extruded Aluminum (Specialized Reflective Sheeting, Types IX and XI) - Supply

Payments will be full compensation for supplying the signs to the worksite, providing a shop drawing when so requested, and for all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.12.7 WARRANTY

The warranty period for this Work shall be 2 years. All materials shall meet the requirements of Section 54.12.5, Acceptance Criteria for the entire warranty period.

## 54.13 MAINTENANCE OF HIGHWAY SIGNS

### 54.13.1 GENERAL

The Work consists of removing and installing signs and sign supports. This includes supply and installation of concrete bases, wooden posts, steel sign supports, breakaway steel posts, wind frames, cluster frames, reinforcing girts, banding signs to poles and work on signs on overhead sign structures or bridge structures.

### 54.13.2 MATERIALS

The Contractor shall supply signs in accordance with Specification 54.12, Supply of Permanent Highway Signs.

The Contractor shall supply all material required for completion of the Work in accordance with the Alberta Transportation Products List.

When wooden sign supports are ordered, the Contractor in consultation with the engineer has the option of supplying and installing steel sign supports if the supports supplied are equivalent to the size of wooden post ordered. Equivalencies will be based on criteria established for wind resistance, load bearing capabilities and crash worthiness. The Best Practice Guidelines for Sign Materials will be included in the Products List which will also list known equivalencies. When the Contractor elects to use steel sign supports in place of wooden posts, the bases and all mounting hardware shall be supplied in accordance with the manufacturer's recommended installation requirements.

Steel sign supports shall not be used in combination with wooden posts on two post installations.

Supply of new signs shall be in accordance with Specification 54.12, Supply of Permanent Highway Signs. Suitable salvaged signs shall be used whenever possible.

The Contractor shall supply mounting hardware in accordance with drawings TEB 1.69, TEB 1.71, TEB 1.72, TEB 1.75, TEB 1.82 and TEB 1.95, and TEB 1.71A, or an equivalent satisfactory to the Engineer.

All sign supports, frames and mounting materials shall be treated with rust proofing products applicable for the type of material supplied.

### 54.13.3 PROCEDURE

Concrete bases and breakaway steel posts shall be installed as shown on drawings TEB 1.82 and TEB 1.83.

Wooden posts shall be installed as shown on drawing TEB 1.70.

Cluster frames shall be installed perpendicular to and facing the approaching traffic lane and shall be securely fastened to the post in accordance with drawing TEB 1.69.

New or salvaged signs shall be mounted in accordance with drawings TEB 1.69, TEB 1.71, TEB 1.72, TEB 1.75, TEB 1.82 and TEB 1.95, and TEB 1.71A.

Sign posts shall be installed plumb with signs and frames installed level horizontally.

The installed sign, support and frame shall be clean and not bent or twisted. Reflectorized surfaces shall be free of scratches and marks and must be securely fastened to the post or frame. Existing signs, supports and bases shall be salvaged and reused wherever possible.



The Engineer will identify the general location of a new installation by means of paint or other marks on the shoulder of the road or by stakes near the shoulder. The Contractor shall establish the exact location of the installation in accordance with drawing TEB 1.70. If this location is not suitable, the Contractor shall obtain approval of an alternate location from the Engineer. The Contractor shall be responsible for having post locations checked for utilities prior to excavating holes. The Contractor shall remove and salvage or remove and dispose of signs, supports and bases as determined by the Engineer.

The Engineer will determine which signs require reinforcing girts and will issue Work Orders accordingly.

Supports and bases shall be replaced with the same size unless otherwise specified by the Engineer.

Steel sign supports used in lieu of wooden posts shall be installed in accordance with the manufacturer's recommended procedures.

When removing a wooden post or steel sign support or concrete base, the existing hole must be filled in such a manner that there is less than 50 mm settlement within the warranty period.

Signs on utility posts shall be mounted using procedures approved by the utility owner. The Engineer will determine when signs are to be banded to utility poles and issue Work Orders accordingly.

#### 54.13.4 TIME TO COMPLETE

The Contractor shall install critical signs, such as "Stop", "Yield", "Wrong Way", "Do Not Enter", Etc., immediately upon request. For other warning and regulatory signs (standard signs), the Contractor shall complete Work within 30 calendar days of the issuance of the Work Order.

For all other signs (non-standard signs), the Work shall be completed within 60calendar days of the issuance of the Work Order.

The aforementioned times are intended for "Reactionary" Work. The Department and the Contractor may revise the "time to complete" to allow for improved scheduling of planned activities.

#### 54.13.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based upon a visual inspection by the Engineer. The Work will be considered acceptable when; sign(s) and supports are plumb and level; all signs, supports and other components are installed according to the applicable drawings; concrete bases are the correct distance out of the ground; all breakaway steel support surfaces are protected by galvanizing or zinc-rich paint; the work site is left clean; and the correct colour, spelling or symbols are on the sign provided.

Any measurement for plumb and level will be done using a rigid two-foot hand level.

#### 54.13.6 MEASUREMENT AND PAYMENT

##### 54.13.6.1 **Wooden Sign Supports**

For measurement payment purposes, steel sign supports shall be considered to be wooden posts and Sections 54.13.6.1.1 and 54.13.6.1.2 will apply equally to both steel and wooden sign supports. However, when two or more steel supports are equivalent to one wooden post in accordance with the Best Practice Guidelines for Sign Materials, payment will only be made for the number of wooden posts which would have been installed or removed.

Measurement will be made of the number of wooden posts supplied and installed within a particular size range.

Measurement will be made of the number of wooden posts removed and disposed of, and the number of wooden posts removed, salvaged and reinstalled.

#### 54.13.6.1.1 Wooden Supports - Supply and Install

Payment for supplying and installing wooden sign supports will be made at the unit price bid per post for:

- "Sign Posts - Wooden, 100 x 100 mm (or equivalent) - Supply and Install",
- "Sign Posts - Wooden, 100 x 150 mm (or equivalent) - Supply and Install", or
- "Sign Posts - Wooden, 150 x 200 mm (or equivalent) - Supply and Install",

regardless of the length of post. Payment will be full compensation for removing and disposing of the existing posts, supplying and installing the new posts, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.1.2 Wooden Supports - Remove and Reinstall

Payment for removal and reinstallation of existing wooden sign supports will be made at the unit price bid per post for "Wooden Sign Posts (or Equivalent) - Remove and Reinstall." This payment will be full compensation for removing and reinstalling of existing posts, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

If an existing support has been pulled out (vandalism), and the existing hole can be reused without excavation, reinstalling the post in the hole is considered incidental to 53.39, Highway Maintenance Work, and not a pay item. In the case of steel sign supports, if the support is bent and can be straightened on site, or if the support has been sheared off and can be reattached using hand tools, the work will also be considered incidental to Specification 53.39, Highway Maintenance Work.

#### 54.13.6.1.3 Wooden Supports - Remove and Dispose

Payment will be made at the unit price bid per post for "Wooden Sign Posts (or Equivalent) - Remove and Dispose" regardless of the size of post. This payment will be full compensation for removing and disposing of wooden posts, removing and disposing or salvaging the sign, backfilling the holes, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

The payment for "Wooden Supports- Remove and Dispose" will only be applicable when the post is not replaced.

#### 54.13.6.1.4 Weaken Wooden Sign Posts within Highway Clear Zone

Wood sign posts previously installed in the highway Clear Zone will only be required to be weakened at the direction of the engineer. The department has now adopted the latest version of the Roadside Design Guide, which includes the requirement that wood posts located in the Clear Zone and with dimensions greater than 100 mm x 100 mm must be modified to meet breakaway requirements. To achieve the breakaway requirements, the post weakening features and implementation strategy described below are to be followed.

1. Existing wood sign posts with dimensions greater than 100 mm x 100 mm are not required to be weakened.

2. All new and replacement wood sign posts with dimensions greater than 100 mm x 100 mm installed in the highway Clear Zone must be weakened to meet breakaway requirements. The following post weakening features must be provided:
  - Two 38 mm diameter drilled holes centered on the post, oriented in the direction perpendicular to the highway.
  - The first hole will be located 100 mm above the ground surface and the second hole will be located 460 mm above the ground surface (360 mm above first hole).
  - Each hole should be filled with expanding Styrofoam flush with the face of the post or sealed by any other method approved by the Engineer..
  - Refer to TEB 1.81 for more information.
3. Any existing wood sign posts with dimensions larger than 100 mm x 100 mm and that are part of a multi-post sign assembly may be required to be weakened at the direction of the Engineer.
  - Post weakening of hazardous posts is to meet the same requirements as new sign posts as described above.

Payment for weakening wooden sign posts will be made at the unit price bid per post for " Wooden Sign Posts - Weakening by Drilling 2 Holes". This payment will be full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.2 **Steel Breakaway Sign Supports**

Measurement will be made of the number of steel posts supplied and installed within a particular size range.

Measurement will be made of the number of steel posts removed and disposed of, and the number of steel posts removed, salvaged and reinstalled.

##### 54.13.6.2.1 Steel Breakaway Supports - Supply and Install

Payment for supplying and installing breakaway steel posts will be made at the applicable unit price bid per post for:

- "Breakaway Steel Posts, W150 x 14 - Supply and Install",
- "Breakaway Steel Posts, W200 x 15 - Supply and Install",
- "Breakaway Steel Posts, W150 x 22 - Supply and Install",
- "Breakaway Steel Posts, W200 x 27 - Supply and Install".

This payment will be full compensation for supplying and installing the post, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

##### 54.13.6.2.2 Steel Breakaway Supports - Remove and Reinstall

Payment will be made at the unit price bid per steel post for "Breakaway Steel Posts - Remove and Reinstall". This payment will be full compensation for removing and salvaging the steel post and sign, hauling salvaged material to the new site, reassembling and installing the support(s) and sign, and all labour equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.2.3 Steel Breakaway Supports - Remove and Dispose

Payment will be made at the unit price bid per steel post for "Breakaway Steel Posts - Remove and Dispose" regardless of the size or length of the support.

This payment will be full compensation for removing and disposing of the steel post, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.2.4 Steel Breakaway Supports – Install Only

Payment will be made at the unit price bid per steel post for "Breakaway Steel Posts - Install". This payment will be full compensation for installing the steel post supplied by others, regardless of size; and for all labour, equipment, tools and incidentals necessary to complete the Work.

### 54.13.6.3 **Signs**

#### 54.13.6.3.1 Supply of Signs

Payment for the supply of new signs will be made in accordance with Specification 54.12, Supply of Permanent Highway Signs.

#### 54.13.6.3.2 Install Signs

Measurement will be made of the number of signs installed within a particular size range. When reinstalling signs on an existing salvaged, or new cluster frame or wind frame, the total area will be measured and considered a single sign.

Payment will be made at the applicable unit price bid per sign for:

- "Install Sign - less than 1 m<sup>2</sup>"
- "Install Sign - 1 m<sup>2</sup> to 3 m<sup>2</sup>"
- "Install Sign - over 3 m<sup>2</sup>"

This payment will be full compensation for delivering signs to the site when necessary, removing and salvaging, or removing and disposing of the existing sign, installing the new or salvaged sign, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.3.3 Remove Signs

Measurement will be made of the number of signs removed and disposed of or removed and salvaged within a particular size range. When several signs are being removed from a single support, the total area of the signs removed will be measured and considered a single sign. When existing signs are being removed from a cluster frame or wind frame, the total area will be measured and considered a single sign.

Payment will be made at the applicable unit price bid per sign for:

- "Remove Sign - less than 1 m<sup>2</sup>"
- "Remove Sign - 1 m<sup>2</sup> to 3 m<sup>2</sup>"
- "Remove Sign - over 3 m<sup>2</sup>"

Payments will be full compensation for removing, salvaging and storing the sign or removing and disposing of the sign, and all labour, materials, tools and incidentals necessary to complete the Work.

The payment for "Remove Sign" will only be applicable when the sign is not replaced, or is scheduled for replacement at a later date, and when the post(s) is not removed.

#### 54.13.6.3.4 Signs on Overhead Structures and Bridge Structures

Measurement will be made of the area in square metres of each sign installed or removed from an overhead structure or bridge structure.

Payment will be made at the unit price bid per square metre for "Sign on Overhead Sign Structure or Bridge Structure - Install" or "Sign on Overhead Sign Structure or Bridge Structure - Remove". Payment for installation will be in addition to the payment for supply of the sign. Payments will be full compensation for installing or removing the sign from the overhead sign structure and all labour, materials, tools and incidentals necessary to complete the Work.

Payment for site specific traffic accommodation and signing will be paid separately in accordance with Specification 53.37, Supply of Flagperson for Emergency Traffic Control and/or Specification 53.38, Supply of Arrowboards for Traffic Control.

#### 54.13.6.4 **Install and Remove Concrete Bases**

Measurement will be made of the number of bases supplied and installed, bases removed, salvaged and reinstalled and bases removed and disposed of.

Payment for installing concrete bases supplied by others will be made at the unit price bid per base for "Concrete Base – Install", and will be full compensation for all labour, equipment, tools and incidentals necessary to complete the Work.

Payment for supplying and installing concrete bases will be made at the unit price bid per base for "Concrete Base - Supply and Install".

Payment for removing, salvaging and reinstalling existing bases will be made at the unit price bid per concrete base for "Concrete Base - Remove and Reinstall".

Payment for removing and disposing of concrete bases will be made at the unit price bid per base for "Concrete Base - Remove and Dispose".

These payments will be full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.5 **Screw-In Sign Base**

Upon prior approval by the Engineer, the Contractor may use Screw-In Road Sign Bases as an alternative to concrete bases.

Measurement will be made by the number of Screw-In Road Sign Bases installed, supplied and installed, removed, salvaged and reinstalled, and removed and disposed of.

Payment for installing screw-in bases supplied by others will be made at the unit price bid per base for "Screw-in Road Sign Base - Install" regardless of diameter size, and will be full compensation for all labour, equipment, tools and incidentals necessary to complete the Work.

Payment for supplying and installing screw-in bases will be made at the unit price bid per base for "Screw-in Road Sign Base - Supply and Install" regardless of diameter size, and will be full compensation for all materials, labour, equipment, tools and incidentals necessary to complete the Work.

Payment for removing, salvaging and reinstalling existing bases will be made at the unit price bid per base for "Screw-in Road Sign Base - Remove and Reinstall", and will be full compensation for all labour, equipment, tools and incidentals necessary to complete the Work.

Payment for removing and disposing of Screw-in bases will be made at the unit price bid per base for "Screw-in Road Sign Base - Remove and Dispose", and will be full compensation for all labour, equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.6 **Supply and Install, or Remove and Dispose, Cluster and Wind Frames**

Measurement will be made in square metres of the area bounded by the outside edge of the cluster frame or wind frame installed or removed.

Payment will be made at the unit price bid per square metre for "Cluster Frames - Supply and Install", or "Wind Frame - Supply and Install". Payments will be full compensation for the supply of the frames, removal and disposal of existing frames, installation of the new frame, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.7 **Girts**

When girts are requested by the Engineer, they will be measured and paid for at the unit price bid per metre for "Reinforcing Girts - Supply and Install". This payment will be full compensation for supplying and installing reinforcing girts, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.13.6.8 **Banding Signs**

Measurement will be made of the number of signs banded to a structure.

Payment for banding signs will be made at the unit price bid per sign for "Banding Signs". This payment shall be full compensation for the supply and installation of banding material, and all labour, materials, tools and incidentals necessary to complete the Work.

Payment for installation of signs will not be paid when there are no other sign supports than what the sign is banded to.

#### 54.13.7 WARRANTY

The warranty period for the installation of wooden sign supports (or equivalent), and the removal of concrete bases shall be 60 days.

The warranty period for installation of breakaway steel sign supports, concrete bases, banding signs, reinforcing girts, cluster frames, and wind frames shall be 1 year.

There is no warranty period for the removal of signs.

**54.14 NOT USED**

**54.15 NOT USED**

**54.16 NOT USED**

## **54.17 PAINTING STEEL POSTS AND FRAMES AND SIGN STRUCTURES**

### 54.17.1 GENERAL

The Work consists of painting of steel posts and frames and overhead steel sign structures to protect non-galvanized surfaces.

### 54.17.2 MATERIALS

The Contractor shall supply an aluminum rust resistant paint, or zinc rich paint acceptable to the Engineer. Zinc rich paints shall be used on galvanized posts, frames or structures.

The Contractor shall supply tarps and spray sheets when necessary.

### 54.17.3 PROCEDURE

The Contractor shall remove all flaking rust or peeling paint from the area to be treated. Remaining paint edges or badly pitted areas shall be prepared to a smooth surface prior to painting.

Prior to painting, the surface to be treated shall be dry and clean. Paint shall be applied by spraying, brushing, rolling or a combination of these methods. Plaques on each overhead steel sign structure, stating its file number, shall not be painted.

All bolts, rivets, plate edges, crevices and corners shall receive complete coverage.

The Contractor shall take precautionary measures to prevent property or environmental damage while painting or removing paint. This may include rescheduling spraying operations to light traffic and/or light wind periods, the use of protective devices such as tarps or spray sheets, or whatever other arrangements may be necessary to prevent paint drift.

### 54.17.4 TIME TO COMPLETE

All Work shall be completed within 60 calendar days of issuance of the Work Order.

### 54.17.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based upon a visual inspection by the Engineer. To be acceptable, flaking or peeling paint must be removed prior to the painting, there must be a complete coverage of paint, and the work site is left in a clean condition.

### 54.17.6 MEASUREMENT AND PAYMENT

Payment will be made as Extra Work in accordance with the Specification 51.2, General (for Maintenance Work). This payment will be full compensation for preparing the surface, supplying and applying the paint, site cleanup, public and environmental protection, and all labour, material, equipment, tools and incidentals necessary to complete the Work.

### 54.17.7 WARRANTY

The warranty period for this Work shall be 1 year.



**54.18 NOT USED**

## 54.19 GUIDE POSTS

### 54.19.1 GENERAL

The Work consists of the supply and installation of flexible guidepost traffic delineators, the removal and disposal of existing guideposts and the removal and reinstallation of existing guideposts.

### 54.19.2 MATERIALS

The Contractor shall supply guideposts in accordance with the Alberta Transportation Products list.

Round posts shall have a minimum outer diameter of 90 mm and an overall length of 1.67 metres, open at the top.

New installation or replacement of delineators shall be as follows:

1. The delineator reflective strips colour should be either florescent yellow or white such that they comply with the principles for pavement edge lines with respect to their colour. Green reflective strips are to be used at concealed intersections. Concealed intersections are described in section C7.2.6 in the Alberta Transportation Highway Pavement Marking Guide as intersections where the approach is in an area that has been delineated for reasons other than the approach (e.g., due to a horizontal curve).
2. The reflective strip shall meet ASTM D4956 Type X for luminance level, and should be 100 mm wide and 330 mm in length. To prevent peeling, three staples (four if two 50 mm strips are used) should be inserted through the overlapped portion of the reflective strip. The reflective strip is to be centered on the top (black) portion of the delineator with 75 mm of the black portion of the delineator exposed both above and below the reflective strip. A diagram indicating the reflective strip placement on the delineator is shown below.

The surface of the post shall be smooth and free from irregularities or defects, the surface of the post shall not be affected by cleaning using scrapers, detergent and water, or solvent. The performance of the posts shall not be affected by ozone, exhaust fumes, asphalt or road oils, dirt, vegetation, deicing salts or any other types of air contamination or materials likely to be encountered after installation.

### 54.19.3 PROCEDURE

The Contractor shall be responsible for location and marking of underground utilities prior to excavation.

The Contractor shall supply and install guideposts plumb and vertical throughout their length, at a uniform height in accordance with drawings TEB 3.49a, TEB 3.49b, TEB 3.49c, TEB 3.49d, TEB 3.49e, TEB 3.50 and TEB 3.51, at locations identified by the Engineer. In some cases, the Engineer will identify that existing guideposts shall be removed and reinstalled at a different spacing.

The applicable colour of high-intensity reflectorized sheeting shall be installed and the work area shall be restored to its original condition.

Refer to HIGHWAY MAINTENANCE BULLETIN #7/2008 for upgrades.

### 54.19.4 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

#### 54.19.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. To be acceptable, the guide posts shall possess the specified material characteristics, shall be installed in accordance with the applicable drawings and the work site shall be left in a neat and tidy condition.

#### 54.19.6 MEASUREMENT AND PAYMENT

Measurement will be made of the number of guideposts supplied and installed, removed or removed and reinstalled.

Payment will be made at the unit price bid per guidepost for "Flexible Guidepost - Supply and Install." This payment will be full compensation for supply of the guideposts, removal and disposal of existing posts when necessary, installation of the new posts, and all labour, material, equipment, tools and incidentals necessary to complete the Work.

Payment will be made at the unit price bid per guidepost for "Flexible Guidepost - Remove and Dispose". This payment will be full compensation for the removal and disposal of the guidepost(s), filling in the old holes, and for all labour, material, equipment, tools and incidentals necessary to complete the Work.

Payment will be made at the unit price bid per guidepost for "Flexible Guidepost - Remove and Reinstall". This payment will be full compensation for the removal and reinstallation of the guidepost(s), filling in the old holes when reinstalling at a different location, and for all labour, material, equipment, tools and incidentals necessary to complete the Work. Reinstallation is not limited to the same location, but may occur anywhere in the same shop area.

If an existing guidepost is pulled out by others (vandalism), and the same post can be reinstalled in the original hole, such work is considered routine highway maintenance as defined in Specification 53.39, Highway Maintenance Work, and will not be paid for separately.

#### 54.19.7 WARRANTY

The warranty period for this Work is 1 year.

## 54.20 WILDLIFE REFLECTORS

### 54.20.1 GENERAL

The Work consists of supplying and installing wildlife reflectors supplying and installing posts, removing and disposing of existing reflectors and replacing reflectors.

### 54.20.2 MATERIALS

The Contractor shall supply Wildlife Warning Reflectors from the Alberta Transportation Products List. The use of other products shall be subject to the approval of the Engineer.

When new installations are specified or the existing posts require replacement, the Contractor shall supply steel posts suitable to the Engineer or 100 mm X 100 mm wooden posts 2.13 m in length.

### 54.20.3 PROCEDURE

The Contractor shall install or replace reflectors according to the manufacturer's recommended procedures, at an interval specified by the Engineer.

The Contractor shall supply a copy of the recommended procedures to the Engineer prior to commencement of the Work.

Posts for the reflectors must be capable of holding the reflector in the correct position and orientation under normal environmental conditions. Posts shall be installed plumb, and the work site left in a clean condition.

The Contractor is responsible for locating underground utilities or services prior to installation.

### 54.20.4 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of issuance of the Work Order.

### 54.20.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. The Work will be considered acceptable when reflector posts are installed plumb, the reflectors are installed straight at the correct height and at the correct location, the installation is performed in accordance with the manufacturer's recommended procedures, and the work site is left in a neat and tidy condition.

### 54.20.6 MEASUREMENT AND PAYMENT

Measurement will be made separately of the number of wildlife reflectors installed and of the number of posts installed.

Payment will be made at the unit price bid per installation for "Wildlife Reflector - Supply and Install". This payment will be full compensation for supplying and installing the reflectors, removal and disposal of existing reflectors when necessary and all labour, material, equipment, tools and incidentals necessary to complete the Work.

Payment will be made at the applicable unit price bid per installation for "Wildlife Reflector Post - Supply and Install Wooden Post (2.13 m)" or "Wildlife Reflector Post - Supply and Install Steel Post (2.13 m)". The applicable payment will be full compensation for supplying and installing the posts, supplying and compacting backfill, removal and disposal of existing posts when necessary and all labour, material, equipment, tools and incidentals necessary to complete the Work.

Salvaging and reinstalling Wildlife Reflectors will be considered incidental to the Work and will not be paid for separately

If an existing reflector - post has been removed, and the same post can be reinstalled in the original hole, such Work will be considered a Routine Highway Maintenance Activity as defined in Specification 53.39, Highway Maintenance Work and will not be paid for separately.

#### 54.20.7 WARRANTY

The warranty period for this Work will be one year.

**54.21 NOT USED**

## 54.22 REMOVE AND DISPOSE OF GUARDRAIL, CABLE BARRIER AND POSTS

### 54.22.1 GENERAL

The Work consists of permanently removing and disposing of guardrail or cable barrier and posts. This specification only applies when guardrail or cable barrier is not being replaced.

### 54.22.2 MATERIALS

The Contractor shall supply suitable material for backfilling of holes.

Unless otherwise directed by the Engineer (prior to issuing the Work Order), the Contractor shall assume ownership of all guardrail materials.

### 54.22.3 PROCEDURE

The Contractor shall remove and dispose of guardrail and posts and/or cable barrier and posts as directed by the Engineer.

Holes shall be backfilled and compacted with material suitable to the Engineer and all excess debris (build up of sand) under the guardrail shall be removed and the site restored to match existing side slopes.

### 54.22.4 TIME TO COMPLETE

The Contractor shall complete the Work within 60 days of the issuance of the Work Order.

### 54.22.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based upon a visual inspection by the Engineer. The Work will be considered acceptable when the site has been left in a neat and tidy condition, all materials have been removed from the site, and the sideslopes are satisfactorily restored.

### 54.22.6 MEASUREMENT AND PAYMENT

Measurement will be made in metres of the length of guardrail and/or barrier removed.

Payment will be made at the unit price bid per metre for "Guardrail/Barrier - Remove and Dispose". This payment will be full compensation for the removal and disposal of guardrail and/or barrier materials, removal and disposal of the posts, supplying backfill material and backfilling holes, cleanup of the disturbed areas, and all labour, equipment, tools and incidentals necessary to complete the Work. Such payment will only be made in situations when the guardrail or cable barrier is not being replaced.

### 54.22.7 WARRANTY

The warranty period for this Work is 60 days.

Settlement greater than 50 mm in disturbed areas occurring during the warranty period shall be repaired at the Contractor's expense.

## 54.23 SUPPLY AND INSTALLATION, REALIGN OR RESET W-BEAM GUARDRAIL AND POSTS

### 54.23.1 GENERAL

The Work consists of supplying and installing W-Beam guardrail and posts, wing ends and bridge connectors for use as hazard avoidance barriers. The Work also consists of replacing posts only, replacing steel w-beam only and realigning or resetting guardrail.

### 54.23.2 MATERIALS

The Contractor shall supply all materials in accordance with the Alberta Transportation Products list and the applicable drawings contained in the Department's Typical Barrier Drawings manual. The Contractor shall satisfy himself that the material provided meets the specified characteristics.

The Contractor may be required to maintain an inventory of materials at locations within the Contract boundaries. The quantities of new barrier sections and posts, which shall be readily available, will be specified in the Special Provisions.

### 54.23.3 PROCEDURES

#### 54.23.3.1 **Installing Guardrail**

Standard installations shall be in accordance with drawing TEB 3.12. Installations at bridge approaches shall be in accordance with drawing TEB 3.48, and construction shall always be started at the bridge. A Strong Post System of installation as shown in drawing TEB 3.09, shall be used on some installations when directed by the Engineer.

Posts shall be accurately set to the required depth and alignment in a smooth, continuous installation, as shown in the drawings or as directed by the Engineer. Permissible tolerance for plumb and grade of posts shall be as shown on the applicable drawings. Short irregularities (generally less than 30 metres long) in the paved surface should not affect the curve of the completed rail. In order to avoid trapping the wheels, there can be no more than a 175 mm gap between the edge of pavement and the face of the rail.

Posts shall be installed to minimize settlement or "lean" over time. Excavated material which is unsuitable for use as backfill shall be substituted with granular material by the Contractor at his expense. Backfill shall be thoroughly compacted using mechanical tampers, in layers not exceeding 150 mm, for the full depth of the excavation. Cementitious materials shall not be used for post support unless specifically authorized by the Engineer.

Guardrail laps shall be in the direction of traffic flow. Bolts shall be tightened with hand tools to approximately a torque of 100 Nm. Metal reflectors shall be attached to the top of every third guardrail post.

The Contractor shall take all necessary precautions to eliminate damage to galvanizing. Minor abrasions shall be repaired by painting with two coats of zinc-rich paint. Major abrasions shall be repaired by regalvanizing. The Contractor, at his own cost, shall carry out the repair or replace components to the satisfaction of the Engineer.

Surplus excavated material and debris shall be removed from the site and disposed of by the Contractor at his expense.

When performing guardrail repairs, the Contractor shall check the adjoining posts for splitting, rotting or other damage and report these to the Engineer.



Installations facing traffic shall not be left unfinished and open-ended when the work site is unoccupied, unless protected as detailed in the Traffic Accommodation in Work Zone manual (Drawing TCS-B-1.11A).

The Contractor shall stamp newly installed guardrail posts with the date of installation as directed by the Engineer. The site of the date stamping shall be coated with an approved preservative material when the continuity of the original treatment is compromised.

#### 54.23.3.2 **Realigning Guardrail**

Work to move guardrail posts back into alignment without having to disassemble the guardrail beam or remove the post(s) from the soil is considered realigning.

#### 54.23.3.3 **Resetting Guardrail**

Work to restore alignment that involves disassembly of the guardrail beam and removing posts from the ground is considered resetting. (The beam is disassembled when a complete section or more of beam is removed from the posts at each end; splices may or may not be broken during disassembly.) Resetting involves removal of the guardrail sections, removal and reinstallation of the existing posts, reinstallation of the guardrail sections and restoration of the alignment and elevation of the rail.

#### 54.23.4 ACCEPTANCE CRITERIA

The Work will be considered acceptable when the reflectors are installed properly, the rail is correctly lapped and within 20 mm tolerance for plumb and grade, the galvanized integrity of the rail has been preserved, the correct date stamps are on the post and rail, posts are installed square to the rail, the work site is left in a clean condition and excess spoil removed. Hot dip galvanized coating shall be smooth, free of beading or sharp projections at edges. Coating adherence shall prevent the peeling of any portion of the zinc coating so as to expose the base metal by cutting or prying with a stout knife under considerable pressure (bond check).

Warped or otherwise deformed rails and terminal elements will be rejected, as will those with injurious defects or excessive roughness of the zinc coating.

The Engineer may verify the penetration and retention of the preservative in wooden posts and blocks by the assay method.

If the guardrail appears to be out of tolerance for plumb or grade, measurements of the height of the guardrail will be made with a tape measure on the section out of tolerance, or using a two-foot hand level for plumb.

#### 54.23.5 TIME TO COMPLETE

In urgent situations the Contractor shall complete the Work within 5 calendar days of the issuance of the Work Order. In all other cases, the Work shall be completed within 60 calendar days of the issuance of the Work Order.

#### 54.23.6 MEASUREMENT AND PAYMENT

##### 54.23.6.1 **General**

Measurement will be made of the number of posts supplied and installed.

Measurement will be in metres of the length of W-Beam guardrail installed, and by the post for existing guardrail realigned or reset.

When the Contractor performs a combination of resetting and "supply and install" work on the same guardrail installation, the appropriate unit price will be paid for the two different types of work.

#### 54.23.6.2 **W-Beam and Elements**

Payment for installing guardrail will be made at the unit price bid per metre for "W-Beam Guardrail-Supply and Install". This payment will be full compensation for removal and disposal of existing guardrail, supplying and installing all required straight W-Beam guardrail sections restoration of the initial alignment of the guardrail, , and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

The supply of end terminals, impact-absorbing end treatments, curved W-beam rail, brackets, wing ends and bridge connections will be paid as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

#### 54.23.6.3 **Strong Post System**

The supply of end terminals, curved W-beam rail, brackets, wing ends and bridge connections for strong post systems will be paid as Extra Work in accordance with Specification 51.2, General (For Maintenance Work). Payment for the supply of spacer blocks will be made at the unit price bid for "Strong Post Spacer Blocks – Supply".

Payment for the installation of the beam section elements will be made at the unit price bid per metre for "W-beam Guardrail - Supply and Install". Payment for the supply and installation of posts will be made at the applicable unit price bid. Payment for the installation of the brackets, spacer blocks and other required hardware will be considered incidental to the Work.

#### 54.23.6.4 **Posts**

Payment for supplying and installing new posts will be made at the applicable unit price bid per post for "Guardrail Posts 1.52 m Wooden - Supply and Install", "Guardrail Posts 1.83 m Wooden - Supply and Install", "Guardrail Posts 2.13m Wooden - Supply and Install", "Guardrail Posts 1.9 m Metal - Supply and Install or "Guardrail Posts Plastic - Supply and Install". Payment will be full compensation for removing and disposing of existing posts, supplying and installing the new posts, detaching and re-attaching of the w-beam, restoration of the initial alignment of the guardrail, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.23.6.5 **Realigning**

Payment for realigning existing guardrail will be made at the unit price bid per post for "W-Beam Guardrail - Realigning". This payment will be full compensation for straightening the guardrail sections, re-plumbing and tamping the posts, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

#### 54.23.6.6 **Resetting**

Payment for resetting existing guardrail will be made at the unit price bid per post for "W-Beam Guardrail - Resetting". This payment will be full compensation for removal of the guardrail sections, removal and reinstallation of the existing posts, reinstallation of the guardrail sections, and all labour, materials, equipment, tools and incidentals necessary to complete the Work. Payment for Resetting will not be made when new posts are installed.

54.23.6.7 **Reduced Time to Complete**

In urgent situations where the Contractor is required to complete any type of guardrail Work within 5 calendar days of the issuance of the Work Order, an additional payment per Work Order will be made at the unit price bid per occurrence for "Guardrail - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work.

54.23.7 WARRANTY

The warranty period for supplying and installing guardrail shall be 1 year. The warranty period for realigning and resetting guardrail is 90 days.

## 54.24 SUPPLY AND INSTALL BOX BEAM GUARDRAIL AND POSTS

### 54.24.1 GENERAL

The Work consists of removal of existing median or shoulder box beam guardrail as required and supply and installation of new box beam guardrail barrier and supply and installation of new box beam posts.

### 54.24.2 MATERIALS

The Contractor shall supply all materials in conformance with the Alberta Transportation Products list. Previously installed material may not be used.

The Contractor shall be responsible for ensuring that the quality of the materials supplied meet the requirements specified.

### 54.24.3 PROCEDURE

All standard box beam installations shall be in accordance with drawings TEB 3.27, TEB 3.28, TEB 3.33, TEB 3.34, TEB 3.35, TEB 3.36, TEB 3.37, TEB 3.38, TEB 3.39, TEB 3.40, TEB 3.41, TEB 3.46, and TEB 3.47. Installations at bridge approaches shall be in accordance with drawings TEB 3.41 and TEB 3.47 and construction shall always be started at the bridge.

All median box beam installations shall be in accordance with drawings TEB 3.22, TEB 3.23, TEB 3.24, TEB 3.25, TEB 3.26, TEB 3.27A, TEB 3.28A, TEB 3.29 and TEB 3.30. Installations at bridge approaches shall be in accordance with drawing TEB 3.29 and construction shall always be started at the bridge.

Posts shall be accurately set to the desired depth and alignment in a smooth, continuous installation. Permissible tolerance for plumb and grade of posts shall be 20 mm maximum.

Installations facing traffic shall not be left unfinished and open ended when the worksite is unoccupied, unless protected as shown in the Department's Traffic Accommodation in Work Zone manual (drawing TCS-B-1.11A).

Reflectors shall be installed immediately under the beam on every sixth post.

### 54.24.4 TIME TO COMPLETE

In urgent situations, the Contractor shall complete the Work within 5 calendar days of the issuance of the Work Order. In all other cases, the Work shall be completed within 60 calendar days of the issuance of the Work Order.

### 54.24.5 ACCEPTANCE CRITERIA

Evaluation of the Work will be based on a visual inspection by the Engineer. The Work will be acceptable when the guardrail:

- is installed according to the drawings and within 20 mm of plumb and grade,
- the galvanized surface integrity of the material is not broken,
- the work site is left in a clean condition, excess spoil is removed, and
- reflectors are installed on every sixth post.

If the completed guardrail appears to be outside the tolerance for plumb and grade, measurements will be made using a tape measure to confirm the height or using a two-foot hand level for plumb.

#### 54.24.6 MEASUREMENT AND PAYMENT

Measurement will be made in metres of the length of box beam guardrail installed or removed and reinstalled. Measurement will be made of the number of posts installed.

Payment will be made at the unit price bid per metre for "Box Beam Guardrail - Supply and Install". This payment will be full compensation for supplying and installing all required guardrail sections, removal and disposal of existing guardrail as required, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

Payment will be made at the unit price bid per metre for "Box Beam Guardrail - Remove and Reinstall." This payment will be full compensation for removal and reinstallation of existing guardrail as required, and all labour, materials, equipment, tools and incidentals necessary to complete the Work. Removal and re-installation of existing beam sections performed as part of replacing posts only, will be paid for at the unit price bid for "Box Beam Guardrail - Remove and Reinstall" for each section of beam removed and reinstalled.

Payment will be made at the unit price bid per post for "Box Beam Guardrail Posts - Supply and Install". This payment will be full compensation for removal and disposal of existing posts, supplying and installing new posts, and all labour, materials, tools and incidentals necessary to complete the Work.

In urgent situations where the Contractor is required to complete any type of guardrail Work within 5 calendar days of the issuance of the Work Order, an additional payment will be made at the unit price bid per occurrence for "Guardrail - Premium". This payment will be full compensation for complying with the accelerated scheduling required to complete the Work. This payment will be made only once per Work Order, regardless of the different types of guardrail Work completed.

#### 54.24.7 WARRANTY

The warranty period for supply and install box beam guardrail and supply of box beam posts only, is 1 year.

When posts are removed and not replaced, the hole must be backfilled such that there is not more than 50 mm settlement during the warranty period.

**54.25 NOT USED**

**54.26 NOT USED**

**54.27 NOT USED**

**54.28 NOT USED**

## 54.29 REPAIR OR REMOVE LINE FENCE

### 54.29.1 GENERAL

The Work consists of minor line fence repairs, removing and disposing of existing paige and barbed wire line fence and restoring the ground surface to its original condition.

Minor line fence repairs are defined as re-attaching or splicing one set of wires (may be at both ends of the set), up to 500 metres in length, and replacing up to 10 broken posts in a 100 metre length.

Line fence repairs which involve re-attaching or splicing one set of wires (may be at both ends of the set) and tightening up to 50 metres of wire, and re-tamping or straightening posts within the 50 metre section are covered under Specification 53.39, Highway Maintenance Work.

### 54.29.2 LABOUR

The Contractor shall provide a two-man crew for performing the required repair or removal work.

### 54.29.3 EQUIPMENT

Equipment considered necessary for this work will be hand tools and man-portable equipment.

### 54.29.4 PROCEDURE

This Contractor shall remove or repair line fence as required and as shown in the Work Order.

Replacement of broken posts identified when performing routine maintenance activities as defined in Specification 53.39, Highway Maintenance Work will be paid for under this specification.

The Contractor shall remove all wire, posts and staples from the worksite.

When line fence is removed, the holes shall be backfilled and compacted with material suitable to the Engineer and the compacted surface shall be restored to its original condition.

The Contractor shall assume ownership of the fence material removed and dispose of it in a suitable location.

### 54.29.5 TIME TO COMPLETE

The Contractor shall complete the Work within 60 calendar days of the issuance of the Work Order.

### 54.29.6 ACCEPTANCE CRITERIA

Evaluation of the work will be based on a visual inspection by the Engineer. The work will be considered acceptable when;

- the fence wire is taut with no loose ends projecting,
- posts are installed plum and properly aligned with the remainder of the fence, and
- the work site is left in a clean condition.

### 54.29.7 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest ¼ hour) for the time travelling to and from the worksite and for the time each 2-man crew is engaged in the Work, in accordance with the following:

- the maximum allowable travel time from the nearest shop to the worksite will be one hour
- the maximum allowable travel time from the worksite to the nearest shop will be one hour
- travel time shall be reported separately on a daily crew worksheet
- two 15 minute coffee breaks per day will be allowed (no deduction)

Payment will be made at the hourly rate bid per 2-man crew for "Line Fence - Repair or Remove". This payment will be full compensation for providing the two-man crew travelling to and from the worksite, hand tools and man-portable equipment required to repair, install or remove fences and clean the worksite, removing and disposing of all fence materials, restoring the ground surface, and all labour, equipment, tools and incidentals necessary to complete the Work.

Payment for the supply of fencing materials will be made as "Extra Work" in accordance with Specification 51.2, General (For Maintenance Work). The Contractor will provide the Engineer with all bills of lading or invoices for such materials upon request.

Payment for line fence over 500 metres in length, and replacement of broken posts in excess of 10 per 100 metre length will be made at an agreed upon negotiated price in accordance with the Extra Work provisions of Specification 51.2, General (For Maintenance Work)

#### 54.29.8 WARRANTY

There is no warranty period for this Work.



## 54.30 BRIDGE STRUCTURE CLEANING

### 54.30.1 GENERAL

The Work consists of the removal and disposal of all dirt, debris and deleterious material and washing of the bridge structure to remove all ice control materials.

#### 54.30.1.1 **Site Meeting**

The Contractor is advised that in conjunction with the commencement of annual bridge washing operations a site meeting will be held at a representative bridge site to review the bridge cleaning and washing requirements. Attendance of the Contractor's bridge washing crew supervisors will be mandatory. This meeting will be considered incidental to the work and no separate or additional payment will be made.

### 54.30.2 MATERIALS

The Contractor shall supply all materials necessary to complete the Work.

Water used for washing the bridge shall not contain any materials that may be damaging to the bridge structure.

### 54.30.3 EQUIPMENT

Regardless of the equipment or method chosen, the bridge structure and appurtenances shall not be damaged in any way by the cleaning operation. Any damage caused by the Contractor's operations shall be promptly repaired at his expense.

### 54.30.4 PERMITS AND APPROVALS

The Contractor shall be responsible for obtaining any permits and approvals required for the supply of water and disposal of dirt and debris prior to commencement of the Work.

#### 54.30.4.1 **DFO - Alberta Operational Statement**

The Contractor shall meet all requirements stated in the Department of Fisheries and Oceans' (DFO) document titled "Alberta Operational Statement, Habitat Management Program, Bridge Maintenance". The most current version of this document shall govern.

A copy of this document can be obtained from the following web site:

<http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territoires-territoires/ab/index-eng.htm>

### 54.30.5 PROCEDURES

#### 54.30.5.1 **General**

When washing overpass structures, the Contractor shall ensure that dirt or debris is not deposited on vehicles or pedestrians passing below.

#### 54.30.5.2 Surfaces To Be Cleaned

The following surfaces shall be cleaned of all dirt, debris and deleterious material and washed with water to remove the remaining chemicals and winter abrasives, provided that these elements are accessible without the use of special equipment such as bucket trucks or snoopers:

- decks, sidewalks, curbs, gutters and the exterior surfaces of sidewalks or curbs,
- railings and truss members including the bottom chord to a minimum height of three metres above the deck surface,
- all associated drainage structures, including drain troughs, drain pipes and flumes,
- the approaches to the bridge and all associated bridge elements for a distance of ten metres, as measured from the abutment joint, including approach guardrail,
- deck expansion joints including troughs located beneath the joints with associated plumbing and deck joints with seals, and
- the entire abutment including the bearings, backwall, breastwall, wingwalls and the abutment seat.

#### 54.30.5.3 Additional Surfaces to Be Cleaned

When required by the Engineer, any or all of the following surfaces shall also be cleaned and washed:

- the end two metres of the superstructure, as measured from the face of the backwall,
- pier caps and pier bearings, and the end two metres of the superstructure, each way, from the centreline of the pier,
- the entire abutment including the bearings, backwall, breastwall, wingwalls and the abutment seat when special equipment is required for access to these elements, and
- the concrete slope protection.

#### 54.30.5.4 Removal of Accumulated Material and Washing the Structure

Prior to cleaning the structure, the Contractor shall plug all deck drains. The drains shall remain plugged for the entire bridge cleaning operation. The Contractor shall then sweep and remove all accumulated dirt and debris from the bridge deck, median, curb and sidewalks prior to washing. The dirt and debris shall be disposed of in a manner which will not contaminate wetlands, waterbodies or other sensitive areas.

Prior to removing water from a naturally occurring water source, the Contractor shall obtain a temporary license for withdrawing water from Alberta Environment.

When washing the structure, the Contractor shall ensure that the water does not run directly into a water course. Water may be channelled into the adjacent vegetated areas to remove any silt, salt or other deleterious material. On large bridges that have deck drains that do not allow the water to flow into the ditches, the Contractor will use vacuum trucks or pumps or other approved methods to safely dispose of the water.

#### 54.30.6 TIME TO COMPLETE

All Work shall be completed within 60 calendar days of issuance of the Work Order.

#### 54.30.7 MEASUREMENT AND PAYMENT

Measurement will be in square metres of the bridge deck cleaned, regardless of the type and size of the substructure and superstructure.

Payment will be made at the unit price bid per square metre for "Bridge Structure - Cleaning". This payment will be full compensation for the supply of water including any required permits and approvals, cleaning and washing all surfaces identified in Section 54.30.5.2, disposal of dirt and debris, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

In situations where a roadway lane closure is necessary to clean an overhead structure, traffic accommodation for the lane closure will be paid for as Extra Work in accordance with Specification 51.2, General (for Maintenance Work).

Payment for cleaning the additional surfaces specified in Section 54.30.5.3, will be made as Extra Work, in accordance with Specification 51.2, General for Maintenance Work.

#### 54.30.8 WARRANTY

There is no warranty period for this Work.

**54.31 NOT USED**

**54.32 NOT USED**

**54.33 NOT USED**

## 54.34 BEAVER CONTROL

### 54.34.1 GENERAL

The Work consists of the removal of beavers and beaver dams from around culvert installations and other areas where there is a possibility of damage to highways or private land, and the installation of protective devices at the ends of culverts to deter future beaver activities.

### 54.34.2 MATERIALS

The type of beaver control protective device installed shall be subject to the approval of the Engineer.

The Contractor shall supply the cage-like protective devices and all other materials necessary to complete the Work.

### 54.34.3 EQUIPMENT

The Contractor shall supply all equipment necessary to complete the Work. Any required specialized or heavy equipment will be shown on the Work Order.

### 54.34.4 PROCEDURES

The Contractor shall contact Alberta Environment regarding permits, policy, and procedure for removal of beavers and for the locations and procedural requirements in the areas of any registered traplines.

The Contractor shall contact the applicable landowners and tenants to obtain permission to enter onto any private property and liaise with the landowner to determine time restrictions and any other operating concerns and to advise if traps will be used. Whenever possible, the landowners concerns shall be dealt with as scheduling and operating requirements.

The designated beaver dams and all debris shall be completely removed from the area and properly disposed of. Beaver dams can be removed by blasting, excavating or any other method that results in the free flow of water and without damaging the culverts. Blasting shall be performed only by a person holding a valid blasting ticket from the appropriate agencies, and the Engineer reserves the right to accept or reject any certification. The beavers shall be removed from the area in accordance with the regulations of Alberta Environment.

#### 54.34.4.1 **DFO - Alberta Operational Statement**

The Contractor shall meet all requirements stated in the Department of Fisheries and Oceans' (DFO) document titled "Beaver Dam Removal, Fisheries and Oceans Canada, Alberta Operational Statement". The most current version of this document shall govern.

A copy of this document can be obtained from the following web site:

<http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territoires-territoires/ab/os-eo03-eng.htm>

### 54.34.5 ACCEPTANCE CRITERIA

The Work will be accepted based upon a visual inspection by the Engineer. The Work will be accepted when water flow is restored and all debris is removed.

54.34.6 TIME TO COMPLETE

The Contractor shall complete the Work within 10 calendar days of issuance of the Work Order.

54.34.7 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest 1/4 hour) for the time spent travelling to and from the worksite, travelling between worksites and engaged in the Work in accordance with the following:

- the maximum allowable travel time from the nearest shop to the worksite will be one hour
- the maximum allowable travel time from the worksite to the nearest shop will be one hour
- travel time between sites will be based on the shortest distance between sites
- travel time shall be reported separately on a daily crew worksheet
- two 15 minute coffee breaks per day will be allowed (no deduction)
- a minimum total time of 3 hours per Work Order will apply.

Payment for removing beavers and beaver dams and installing beaver control devices will be made at the unit price bid per hour for "Beaver Control". This payment will be full compensation for supplying a qualified trapper or blaster, installing the beaver control protective devices, travelling time, supplying a pickup truck and all labour, hand tools and incidentals necessary to complete the Work.

When the Engineer determines and directs that heavy equipment is required to complete the Work, payment for such equipment will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

When explosives are required, payment for the supply of the explosives will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

Payment for the supply of the beaver control protective device will be made as Extra Work in accordance with Specification 51.2, General (For Maintenance Work).

54.34.8 WARRANTY

The warranty period for the protective devices shall be 1 year.

There is no warranty period for the removal of the beaver dam and beavers.

## MISCELLANEOUS MAINTENANCE

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## 55.1 BRIDGE MAINTENANCE

### 55.1.1 GENERAL

The Work consists of maintenance on “bridge structures” which typically includes bridges, bridge size culverts, watercourse training works and overhead sign structures. Bridge size culverts are defined as those culverts or group of culverts that have an equivalent diameter of 1500mm or greater.

For this specification, the term "Work Order" will include "Bridge Authorization".

In general, once the work is described, it shall be completed as per the site specific instructions and drawings as well as the current Specifications for Bridge Construction, Bridge Materials Specifications, all applicable “Standard and Typical Bridge Drawings” and accepted bridge maintenance practices.

Bridge Maintenance Work Orders generally involve routine repair and maintenance of bridge structures where the value of the work will be less than \$100,000 per site. The work may include, but will not necessarily be limited to the following:

#### 55.1.1.1 **Bridge Structures**

joint repair (cover plates/seals)	resetting bearings
touch-up painting	backwall sheeting
corbel/cap replacement	wheelguard repair
subdeck replacement	temporary abutment and pier support
retrofit drain installations	concrete sealer application
repair of wing sheeting, piling	accident damage repair
repair/replacement of structural steel members	repair/replace stripdeck
deck patching (epoxy polymers, silica fume, etc.)	approach slab repairs
concrete patching	epoxy injections
galvanizing handrail	heat straightening

#### 55.1.1.2 **Culverts**

culvert strutting  
culvert extensions  
reinforced concrete floor repair and installation  
shot-crete repairs  
"partial" tunnel liners  
bulkheads  
pressure grouting  
headwalls, cutoff walls  
concrete collar repair and replacement

#### 55.1.1.3 **Waterway**

drift removal  
rip-rap replacement and installation (with associated geotextile fabric repair and installation)  
minor headslope restoration  
erosion control features  
gabions

### 55.1.2 MATERIALS

Materials incorporated into the Work shall conform with the Bridge Materials Specifications and, if applicable, be selected from the Alberta Transportation Products List (paints, concrete sealers and patching materials, etc.) unless otherwise specified.

All waste materials shall be disposed of in a manner acceptable to the Engineer. Upon the request of the Engineer, the Contractor shall provide a written acceptance from the receiver of any disposed of materials.

### 55.1.3 PLANNING AND AWARDING WORK

#### 55.1.3.1 **Awarding Work**

When the scope of the Work is identified, the Engineer will provide the Contractor with the following information and request that the Contractor submit a written quote to do the work. The Contractor shall then submit a written quotation for the Work. Quotations will generally be requested on a unit price, lump sum basis, or on an hourly rate basis in accordance with the Extra Work Section of Specification 51.2, General (For Maintenance Work). For projects that involve work on more than one bridge site, the quotation shall detail the cost for each individual site.

If the quotation is acceptable the Engineer will issue a Work Order and the Work may then commence in accordance with the specified terms and conditions.

- bridge file number job number (required for payment purposes)
- structure location
- structure type, including length, width, etc.
- environmental permits/licenses (if required)
- written instructions and sketches, any applicable work details describing the work to be done
- time to complete
- supplemental information, such as engineering drawings, standard drawings, approved material lists, etc.

If the quotation is initially unacceptable to the Engineer, the Contractor will be allowed the opportunity to justify his submission or explore innovations or scope changes. If at this stage, the quotation continues to be unacceptable to the Engineer, the quotation will be rejected and the Department will consider other alternatives for the completion of the Work, including contracting with others in accordance with Specification 51.2, General (For Maintenance Work) regarding Contracting of Other Work.

During the progress of the Work, if it becomes apparent that the scope of Work or quantity of Work changes significantly, the Contractor shall immediately notify the Engineer who may:

- Direct the Contractor to continue with the Work at the existing unit prices,
- Negotiate new unit prices or a revised lump sum cost,
- Direct the Contractor to discontinue the Work and make the structure safe. The Work may then be completed by separate contract in accordance with Specification 51.2, General (For Maintenance Work).

#### 55.1.3.2 **Emergency Work**

The Contractor will immediately advise the Engineer, or be immediately advised by the Engineer of urgent or emergency work such as:

- oversize load collisions
- overload damage
- hazards created by other types of accident damage
- loose or protruding deck joint plates
- severe deflection of culverts
- any item or condition on a bridge structure that presents a danger to the travelling public

and immediately take the appropriate action to protect the travelling public and/or make repairs in accordance with Specification 51.2, General (For Maintenance Work) regarding Emergency Situations.

#### 55.1.3.3 **Non-Emergency Work**

The Engineer, in consultation with the Contractor, will program the non-emergency work, considering:

- weather constraints
- environmental constraints
- irrigation and flow constraints
- work volumes, types and lead times to permit the Contractor to plan the delivery of the Work in a cost-effective and efficient manner.

#### 55.1.4 ACCEPTANCE SAMPLING AND TESTING

The Contractor is responsible for quality control on workmanship and materials incorporated into the Work, and shall, unless otherwise directed by the Engineer, perform quality assurance checks, inspections and acceptance of fabricated materials in accordance with:

- Specifications for Bridge Construction,
- Applicable Standard and Typical Bridge Drawings,
- Bridge Materials Specifications.

#### 55.1.5 RESPONSE TIME AND TIME TO COMPLETE

For emergency situations, the response times shall be immediate. In all other cases, the Work shall be completed by the completion date shown on the Work Order.

A request for an extension to the completion date will be considered in situations where there is a delay in availability of the site, scheduling difficulties resulting from other Work being performed by the Contractor or where the scope of the Work is increased by the Engineer. Any request for extension shall be submitted to the Engineer in writing within 3 days of the start of the delay or of the commencement of the extra or additional work.

#### 55.1.6 MEASUREMENT AND PAYMENT

The Contractor will complete all requested work records, such as:

- technical data (i.e. concrete strength reports, pile data, surveys/profiles, etc.)
- pictures, sketches, or drawings
- bridge inspection reports
- as-constructed drawings
- diaries (when required)

Payment shall be on the basis shown on the Work Order for all the completed Work therein described. Where no specific provision is made for progress payments, payment shall be made only upon the Engineer's acceptance of the Work.

55.1.7 WARRANTY

The warranty period shall be as shown on the Work Order and shall commence on the date of the final acceptance of the Work as determined by the Engineer.

## **55.2 HAULING**

### 55.2.1 GENERAL

The Work consists of loading subgrade soil, granular materials or asphalt mixtures to trucks and the transporting of these materials from the point of loading to a designated delivery location.

Where the application of conversion factors is necessary, the conversion factors detailed in the Special Provisions shall be used unless other factors are determined on site by the Engineer from actual weight and dimension measurements and volume calculations.

### 55.2.2 MATERIALS

The Contractor shall supply all materials required for initial conditioning, dust control, maintaining, and restoring the approved haul routes, as described herein.

### 55.2.3 PROCEDURE

#### 55.2.3.1 **Haul Restrictions**

The Engineer may restrict or disallow hauling altogether when excessive damage occurs to highways or public roads; and when hauling operations create a hazard or are too difficult to contend with for other users of the roadway.

The conditions under which this may apply include but shall not be limited to the following:

- during spring thaw,
- during after a heavy rainfall, or
- during periods of exceptionally high traffic flows.

The Contractor shall abide by all load restrictions established by the local road or bridge authority having jurisdiction.

#### 55.2.3.2 **Haul Route Inspection and Approval**

A haul road is a route over which materials are hauled for the performance of the Contract.

Prior to commencement of haul, haul roads shall be inspected by authorized representatives of the road authority, the Contractor, and the Engineer to establish and record the general existing conditions. Upon completion of haul, the Contractor shall restore the road to a condition equivalent to or better than that which existed at the time haul commenced.

Another inspection shall then be carried out by authorized representatives of the local road authority, the Contractor, and the Engineer. The Engineer shall be the final authority in assuring the restoration required.

The Contractor shall inform the Engineer of the location of his prospective aggregate and asphalt pavement patching material sources and individual haul routes prior to commencement of the Work. The Contractor shall be responsible for obtaining authority to haul over the proposed haul routes from the agency having jurisdiction. The use of provincial highways as haul routes is subject to the approval of the Engineer.

The Contractor shall initially condition, maintain and restore haul routes to the agreed condition of the agency having jurisdiction, and in the case of provincially owned or controlled roads to the satisfaction of the Engineer.

The Contractor shall be responsible for the new construction, initial conditioning, maintenance, dust control and restoration of public and private roads required for his haul

### 55.2.3.3 **Calculation and Approval of Haul Distance**

The haul distance shall be the measured distance in kilometres and tenths of a kilometre along the designated route between the point of loading and the designated delivery point. The designated delivery point shall be considered as the centre of the project kilometre, except:

- if a section is shorter than one kilometre, the designated delivery point shall be the centre of that section.
- if a dead haul road splits a project kilometre into two sections, the designated delivery point shall be the centre of each section.

If in the opinion of the Engineer, a material haul distance is excessive when compared to the known distances of other sources of the same material, then the Engineer will set a maximum allowable haul distance for which payment will be made.

## 55.2.4 MEASUREMENT AND PAYMENT

### 55.2.4.1 **Haul**

When payment for haul in tonne-kilometres or cubic metre-kilometres is specified, the haul distance will be measured in kilometres and tenths of a kilometre along the designated route between the point of loading and the designated delivery point.

Payment for haul will include the cost of loading the material into the trucks.

No payment will be made for hauling to stockpiles where the source and the stockpiles are located within the boundary of the site where the aggregate is being processed.

The quantity of haul will be calculated to the nearest one-tenth of a unit by multiplying the weight or volume of the material by the haul distance for each kilometre or section of a kilometre. The weight or volume will be measured as specified under the specification for the material hauled and payment will be made at the applicable unit price bid per tonne-kilometre or cubic metre-kilometre for "Haul - tonne kilometre" or "Haul - cubic metre kilometre".

### 55.2.4.2 **Haul Roads**

In cases where the Engineer designates both the aggregate (or asphalt mix) source and the haul road to be used, all costs associated with new construction, initial conditioning, control of dust, maintenance, and the final restoration of haul roads will be paid for as "Extra Work" in accordance with Specification 51.2, General for Maintenance Work. In all other cases, these costs shall be considered incidental to the Work and will not be paid for separately.

## 55.2.5 WARRANTY

There is no warranty period for this Work.

## 55.3 AGGREGATE PRODUCTION AND STOCKPILING

### 55.3.1 GENERAL

The Work covers the general requirements for production, gradation, stockpiling, and pit operations for specified aggregate materials.

### 55.3.2 AGGREGATE SOURCE REQUIREMENTS

For any aggregate source used, including Department Sources the following shall apply:

- The Contractor shall ensure a Development and Reclamation Approval or a lease or license to extract from Alberta Environment and a clearance from the Archaeological Survey of Alberta are in place prior to commencement of the Work.
- The Contractor assumes full responsibility for the quantity and quality of the material in the source.
- The Contractor shall acquire the necessary rights to take materials from the sources.
- The Contractor shall explore and develop the sources.
- The Contractor shall save the Department harmless from any and all claims resulting from the use of the aggregate sources.
- The Department will not consider the use of aggregates from existing stockpiles unless the Contractor can satisfy the Engineer that the aggregate in question meets all required specifications. Agreement by the Department that such pre-prepared aggregates can be used will not constitute acceptance of the material in stockpile. Acceptance of such material will be based on testing done by the Engineer as the material is incorporated into the Work.

### 55.3.3 EQUIPMENT

The Contractor shall supply all equipment necessary to complete the Work.

### 55.3.4 PROCEDURE

#### 55.3.4.1 **General**

Aggregate produced from all sources shall comply fully with the specifications, and the Contractor shall recognize and satisfy himself 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 on Table 55.3.4.1(A) 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.

In Department sources, all material up to and including 300 mm diameter shall be crushed.

Acceptance of processed aggregates shall take place when they are in their final position and have met all the requirements of the Contract. The Engineer may test at any time and reject material that does not meet specifications. The final position for a crushing and stockpiling bid item will be the stockpile.



**TABLE 55.3.4.1(A), SPECIFICATIONS FOR AGGREGATE**

Designation		1			2				3				4			5		6		7	8	9				
Class (mm)		10	12.5	16	*16 (N2)	20	25	40	12.5 AW	12.5 BW	12.5C	16	20	25	40	8	*10 (N3)	80	125	40	40	8 (N3)				
Percent Passing Metric Sieve (CGSB 8- GP- 2M)µm	125 000																		100							
	80 000																		100							
	50 000																	55-100	55-100							
	40 000							100							100						100	100				
	25 000							100	70-94																	
	20 000						100	82-97						100		55-90										
	16 000			100	100	84-94	70-94	55-85				100														
	12 500		100	80-92	89-100				100	100	100	72-95														
	10 000	100	83-92	70-84	78-94	63-86	52-79	44-74	35-65	55-75	70-93	53-82	35-77	30-77	25-72		100					85-100	78-95			
	8 000																100						100			
	5 000	60-75	55-70	50-65	55-70	40-67	35-64	32-62	0-15	0-15	30-60	27-54	15-55	15-55	8-55	75-100	75-100	20-65	20-65			60-85	85-100			
	1250	26-45	26-45	26-45	26-45	20-43	18-43	17-43	0-3	0-3	9-28	9-28	0-30	0-30	0-30	0-65	0-65				40-100	27-57	45-75			
	630	18-38	18-38	18-38	18-38	14-34	12-34	12-34																30-50		
	315	12-30	12-30	12-30	12-30	9-26	8-26	8-26			0-15	0-15				0-30	0-30	6-30	6-30	17-100	5-29	18-30				
160	8-20	8-20	8-20	8-20	5-18	5-18	5-18			0-11	0-11				0-18	0-18					0-15	10-21				
80	4-10	4-10	4-10	4-10	2-10	2-10	2-10	0-0.3	0-0.3	0-8	0-8	0-12	0-12	0-12	0-10	0-10	2-10	2-15	6-30	0-5	5-15					
% Fracture by Weight (2 Faces)	All +5000	60+	60+	* See Note (N1)	60+	60+	60+	50+	75+ (100% 1 Face)	75+ (100% 1 Face)	60+	60+	40+	40+	25+	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Plasticity Index (PI)		NP	NP	NP	NP	NP-6	NP-6	NP-6	N/A	N/A	NP-4	NP-4	NP-8	NP-8	NP-8	NP-6	NP-6	NP-8	NP-8	NP-5	NP-5	NP				
L.A. Abrasion % Loss Max.		40	40	40	50	50	50	50	35	35	35	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35				
Flakiness Index	N/A								MAX 15				N/A													
Coefficient of Uniformity (Cu)	N/A																		3+	N/A						
Designation 1 - Asphalt Concrete Pavement Designation 2 - Base Course Aggregate Designation 3 - Seal Coat Aggregate Designation 4 - Gravel Surfacing Aggregate Designation 5 - Sanding Material					Designation 6 - Pit-run Gravel Fill Designation 7 - Cement Stabilized Base Designation 8 - Granular Filter Aggregate Designation 9 - Slurry Seal Aggregate								N1. Asphalt Concrete Mix Type 1 - 90+ (100% 1 face) Asphalt Concrete Mix Type 2 - 70+ Other Asphalt Concrete Mix Types - 60+ N2. Designation 2 Class 16 Material is for ASBC N3. For crushed aggregates other than Des. 9 material and Des. 5 Class 10 material, a tolerance of three percent in the amount passing the maximum size sieve will be permitted provided that all oversize material passes the next larger standard sieve size													

### 55.3.4.2 Sampling and Testing

#### 55.3.4.2.1 General

In all sources, quality control testing is the responsibility of the Contractor. Tests performed by the Engineer will be quality assurance tests and will not be considered as quality control tests.

#### 55.3.4.2.2 Test Methods

Unless otherwise specified, the latest edition of the test methods shown in Table 55.3.4.2.2(A) will be used to determine aggregate material characteristics.

**TABLE 55.3.4.2.2(A)**  
**Test Methods Used to Determine Aggregate Material Characteristics**

TESTS	STANDARD
Sampling, Gravel and Sand	ATT-38
Sieve Analysis	ATT-25 or 26
Sieve Analysis, 80 000 µm Minus, Part II - Pit-Run Contamination, - 5 000 µm Sieve Analysis	ATT-25, Part II
Determining the Liquid Limit of Soils	AASHTO T 89
Dry Strength, Non-Plastic Aggregates	ATT-54
Determining the Plastic Limit and Plasticity Index of Soils	AASHTO T 90
Percent Fracture	ATT-50
Classification of Soils for Engineering Purposes (for definition of Coefficient of Uniformity, Cu)	ASTM D2487
L.A. Abrasion	AASHTO T 96
Flakiness Index	ATT-49
Detrimental Matter in Coarse Aggregate	TLT-107

Note:

In all Test Methods used as reference in this specification, metric sieves as specified in Canadian General Standards Board specification 8-GP-2M shall be substituted for any other specified wire cloth sieves in accordance with Table 55.3.4.2.2 (B).

TABLE 55.3.4.2.2 (B)

SIEVES IN ACCORDANCE WITH: AASHTO DESIGNATION: M 92 ASTM DESIGNATION: E 11			METRIC SIEVES IN ACCORDANCE WITH: CGSB SPEC. 8-GP-2M
(U.S. STANDARD SERIES) (OPENING AND DESIGNATION)			
125.0	mm	5"	125 000
75.0	mm	3"	80 000
63.0	mm	2-1/2"	63 000
50.0	mm	2"	50 000
37.5	mm	1-1/2"	40 000
25.0	mm	1"	25 000
19.0	mm	3/4"	20 000
16.0	mm	5/8"	16 000
12.5	mm	1/2"	12 500
9.5	mm	3/8"	10 000
8.0	mm	5/16"	8 000
4.75	mm	#4	5 000
2.36	mm	#8	2 500
2.00	mm	#10	2 000
1.70	mm	#12	1 600
1.18	mm	#16	1 250
0.850	mm	#20	800
0.600	mm	#30	630
0.425	mm	#40	400
0.300	mm	#50	315
0.150	mm	#100	160
0.075	mm	#200	80
0.045	mm	#325	45

#### 55.3.4.2.3 Quality Control Testing

The Contractor shall provide and maintain equipment and qualified personnel to perform all field testing necessary to determine and monitor the characteristics of the materials produced and incorporated into the Work.

The Contractor shall provide safe and convenient means for accurately and representatively sampling each aggregate stream being produced during all screening, splitting and crushing processes.

#### 55.3.4.3 **Pit Operations**

All reject material produced in a Department source shall be disposed of as directed by the Engineer and the Contractor shall have no claim to the material.

In all sources, the Contractor shall comply with the conditions set by Alberta Environment when removing frozen topsoil, subsoil and inorganic overburden.

All aspects of clearing, removal of overburden, protection and safety of livestock, general pit management and clean up shall be the responsibility of the Contractor except where the Contractor elects to use a Department Source, in which case the pit management and development will conform to the Department's development and operation plan.

#### 55.3.4.4 **Reclamation**

The standards and conditions for appropriate development and reclamation as required by Alberta Environment shall apply to all sources.

#### 55.3.4.5 **Stockpiling**

When aggregate stockpiles are specified or used as part of maintenance work, the following shall apply.

- When stockpiling is specified in the Contract, the location of the stockpile sites shall be determined by the Contractor unless otherwise specified or required by the Engineer.
- If, in order to expedite his operation, the Contractor constructs temporary stockpiles at sites of his own choosing, he shall arrange for such sites and be responsible for them in all respects, including all costs for clearing, removal and salvage of overburden and other site preparation and reclamation. The Contractor shall also obtain approvals and clearances from Alberta Environment and the Archaeological Survey of Alberta for these sites prior to commencement of the work.
- Stockpiles shall not be constructed at locations or by methods that will interfere with or damage any utilities such as power lines, telephone lines, pipelines, and underground utilities.
- Sites shall be cleared to the required dimensions. Topsoil and subsoil shall be separately excavated to the full depth or 300 mm, whichever is greater, and stockpiled separately. Stockpile sites shall be shaped to a uniform smooth surface and graded to ensure positive drainage.
- Stockpiles shall be constructed by first distributing material uniformly over the entire base, and building upwards in successive layers not exceeding a thickness of 2 m.
- Construction operations shall be controlled to prevent segregation of the various particle sizes.
- Crushed aggregate or pit-run shall not be pushed or dumped over the edges or down the faces of stockpiles.
- Stacking conveyors will not be permitted for stockpiling Designation 2, all classes, and Designation 3 Classes 12.5C and 16 crushed aggregate.
- Stacking conveyors may be used for Designation 1 material upon approval of the Engineer.
- Stacking conveyors may be used for stockpiling all other designations and classes of aggregate.
- Completed stockpiles shall be neat and regular in form and shall be constructed to occupy the smallest feasible area taking into consideration the bearing capacity of the foundation soils and the requirements of the Occupational Health and Safety Act.

- If different types of material are to be stockpiled, the piles shall be located and constructed so that no intermixing of material will occur.

#### 55.3.4.6 **Aggregate Production**

The Contractor shall produce aggregates conforming to the specifications for the designations and classes called for in the Contract.

When required by the Engineer, the Contractor shall submit a written proposal to the Engineer, detailing aggregate processing procedures intended to be used. These proposed procedures will require the approval of the Engineer. Aggregates produced prior to this approval will not be accepted.

When required by the Engineer, the Contractor shall notify the Engineer a minimum of two days in advance of the start of aggregate production to allow the visual inspection of the process and testing of the production as deemed necessary by the Engineer. This inspection and testing will not relieve the Contractor of any responsibility in producing aggregate materials that meet all specification requirements.

Any recombining of aggregates or addition of blend materials shall be performed so that a uniform mix of the various sizes is achieved.

The Contractor shall ensure that manufactured fines are retained in the crushed aggregate stockpile.

#### 55.3.5 MEASUREMENT AND PAYMENT

The production of aggregates including any aggregate gradation adjustments and modifications will not be paid for separately. The cost of this Work will be considered included in the unit price bid of the work item for which the aggregates are being produced.

The costs of quality control, obtaining approvals and rights to use an aggregate source, the exploration, development and reclamation of the sources, clearing and overburden removal, and the erection and removal of temporary fences will be considered incidental to the Work and will not be paid for separately.

## 55.4 SUPPLY OF AGGREGATE

### 55.4.1 GENERAL

The Work consists of supplying aggregate for use in the production of sand, pit-run gravel, granular base course or asphalt mixtures. Generally, the Contractor will have the option of supplying the aggregate from Department sources or other sources of his choice. However, in certain instances, the Engineer will direct the Contractor to obtain aggregate from Department sources or other sources to which the Department has access.

### 55.4.2 DEFINITIONS

A Department Source is defined as:

- a source owned by the Department, or
- a Crown source on which the Department has a reservation, or
- a private source on which the Department has a royalty agreement, and holds an approval under the Environmental Protection and Enhancement Act, or
- An asphalt mix plant, or an asphalt mixture, pit-run, crushed gravel or sand source to which the Department has access.

A Contractor Source is defined as any source which is not a Department Source including Crown Sources on undeeded land which are operated privately under lease or licence and for which the Department does not have a reservation.

### 55.4.3 PROCEDURE FOR USING DEPARTMENT SOURCES

In situations where the Contractor intends to use a Department Source, he shall confirm the availability of the source and any conditions concerning the use of the source with both the Contract Inspector and the Department Regional Aggregate Co-ordinator prior to entering the source.

Immediately following completion of the Work Order, the Contractor shall report the quantity of aggregate which was removed from the source to both the Contract Inspector and the Aggregate Co-ordinator. At this time, the Contractor may also be required to update the Departments plan of the source to indicate the extent of the aggregate removal operations.

Disposal of asphalt materials, solonetzic soils or any other construction or maintenance material in Department Sources is not permitted.

### 55.4.4 MEASUREMENT AND PAYMENT

#### 55.4.5 Department Source

When the Contractor supplies aggregate from a Department Source, the Contractor shall be deemed not to have supplied this aggregate and therefore, no payment will be made under the bid item "Supply of Aggregate" for this material.

55.4.6 Contractor Sources

When the Contractor obtains aggregate from a Contractor Source, the Engineer will measure the material containing the aggregate from this source which has been incorporated into the accepted Work and calculate the weight of the aggregate component from this source. In this calculation, no deduction will be made for an asphalt component of the aggregate material.

If the aggregate has been obtained from a Crown Source on undeeded land which is operated privately under lease or licence and for which the Department does not have a reservation, payment will be made at the applicable Contract unit price per cubic metre or tonne for "Supply of Aggregate" minus \$0.48 per tonne (converted to cubic metres in accordance with Specification 55.2, Hauling as necessary). This reduction recognizes that royalty payments to Alberta Environment are not applicable for aggregate supplied to public works projects.

If the aggregate has been obtained from any other Contractor Source, payment will be made at the applicable Contract unit price for "Supply of Aggregate."

These payments will be full compensation for the cost of supplying the aggregate.

When conversion of material measurements between tonnes and cubic metres is required, the conversion factors specified in the Special Provisions will apply.

## 55.5 SUPPLY OF ASPHALT

### 55.5.1 GENERAL

The Work consists of supplying asphalt materials including ordering, scheduling, delivering, supplying storage facilities, handling, storing, sampling, testing and other related work.

For purposes of this specification, the term "Asphalt Supplier" shall mean the party awarded an order by the Contractor for the supply of asphalt.

### 55.5.2 MATERIALS

#### 55.5.2.1 **General**

The Contractor shall supply the types and grades of asphalt specified for the Work in accordance with Specification 5.7, Supply of Asphalt, of the latest edition of the Standard Specifications for Highway Construction.

The Contractor may be required to use more than one type or grade of asphalt for a particular purpose. Any change in asphalt type or grade shall be subject to the approval of the Engineer.

The Engineer reserves the right to discontinue the use of any asphalt product that fails to handle or perform to expectation or satisfaction, regardless of its compliance with the specifications.

### 55.5.3 EQUIPMENT

The Contractor shall supply all equipment necessary to complete the Work.

### 55.5.4 PROCEDURE

#### 55.5.4.1 **Delivery, Handling and Storage**

The Contractor shall provide and maintain adequate asphalt storage facilities and reclaim the storage site to a condition equivalent to or better than that which existed at the time his storage and handling of material commenced.

Storage facilities for asphalt cement shall be capable of heating the material under effective and positive control at all times and shall contain provision for measuring and sampling.

No asphalt type or grade shall be diluted or mixed with a different type or grade, or with any other material, without the specific approval of the Engineer.

The Contractor shall prevent contamination of the asphalt by asphalt of another type or grade, by solvent, or by any other material. Asphalt storage tanks shall be emptied of one type or grade of asphalt, and cleaned as necessary to prevent detrimental contamination of the asphalt, before placing another type or grade of asphalt therein. Asphalt emulsions shall be protected from freezing.

### 55.5.5 SAMPLING AND TESTING

All asphalt delivered to the storage site shall be subject to inspection, sampling and testing by the Engineer. The Contractor shall provide safe, convenient access, acceptable to the Engineer, for inspection and sampling of the asphalt, and shall cooperate in the inspection and sampling process when requested to do so.



The Contractor shall ensure that all asphalt delivery tanks are equipped with sampling valves maintained in good operating condition which are designed and located to enable safe, representative sampling into one litre containers.

55.5.6 MEASUREMENT AND PAYMENT

Payment for the supply of asphalt material will be included in the unit price bid for the item of work for which the material is being used.

## 55.6 SUPPLY OF LABOUR AND TRUCKS FOR MISCELLANEOUS WORK

### 55.6.1 GENERAL

The Work consists of supplying labour and trucks for miscellaneous work that is not associated with Extra Work projects. Following is a list of typical activities requiring miscellaneous labour:

#### 55.6.1.1 **Hand Trimming**

- Hand trimming for areas in-accessible to the mower. Typically these areas will include sections with erosion control devices, overpass embankments and ramps, and other steep slopes

#### 55.6.1.2 **Inspections**

- assisting MCI/FST in collection of SCR data, inventory and other necessary data
- installation and repair of barricades and installation and repair of barricade flashers on the transitions from 4 to 2 lane highways and other places where temporary installations exist
- installation of batteries and flasher heads on highway appurtenances.
- removal of enviro berms and maintenance of erosion control structures throughout the highway network.

#### 55.6.1.3 **Chemical Vegetation Control**

- hand picking weeds in inaccessible areas, slide areas, backslopes near creeks and water runs that cannot be sprayed.
- delivering bagged noxious and restricted weeds to MD Field offices for disposal.

#### 55.6.1.4 **Beaver Control**

- removing and disposing of debris accumulated in culverts and ditches, as a result of beaver activity, when blasting is not required.

### 55.6.2 EQUIPMENT

The Contractor shall supply all hand tools necessary to perform the Work.

The Contractor shall supply the necessary vehicle (1 ton truck or smaller) required to transport personnel and hand tools to and from the job sites.

### 55.6.3 MEASUREMENT AND PAYMENT

Measurement will be in hours (to the nearest ¼ hour) the vehicle and/or labourer spends travelling to and from the worksite, and is engaged in the Work. The maximum allowable travel time from the nearest shop to the worksite will be one hour. The maximum allowable travel time between worksites will be one hour.

Payment will be made at the unit price bid per hour for “Supply of Truck (Miscellaneous Work)” and/or “Supply of Labourer (Miscellaneous Work)” under the applicable activity for which the work has been ordered.

### 55.6.4 WARRANTY

There is no warranty period for this Work.