CONTRACT ADMINISTRATION MANUAL

HIGHWAY AND BRIDGE MAINTENANCE

Version 3, 2010

Government of Alberta
Transportation

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- INTRODUCTION -

This manual is a revised version and replaces Alberta Transportation's *Contract Administration Manual for Highway and Bridge Maintenance* issued in October 2003.

This manual is intended to provide a framework for consistent administration of highway maintenance contracts province-wide. This manual outlines the duties and responsibilities of Alberta Transportation's highway maintenance sector employees and the Highway Maintenance Contractors, and provides proper protocol for handling issues that arise from contract interpretation and work specifications.

This manual is not intended to replace or modify the contents of the Department's highway maintenance contracts or specifications.

Any omissions, obvious errors, or recommendations for future updates to this manual should be forwarded to the Director of Highway Operations of the Department's Technical Standards Branch.

Because the ministry's name changes periodically, the term "Department" is used to identify Alberta Transportation, or the current name of the ministry.

The Appendices referred to in this document are not included with the printed version but are available online at http://www.transportation.alberta.ca/4274.htm. Reference materials and forms included in the appendices will be updated online as new versions become available.

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1.0 GENERAL MAINTENANCE CONTRACT POLICY

1.0.1 GENERAL

Alberta Transportation (AT) wants to foster a strong working relationship with its Highway Maintenance Contractors. The relationship has been carefully structured to draw on the strengths of the government and private sector organizations involved in maintaining Alberta's Provincial Highways and bridges.

A strong relationship helps the Work be completed safely, on time, on budget, and within the plans and specifications laid out in the contracts to which all participants have agreed.

1.0.2 MANUAL'S APPROACH

Alberta Transportation and Contractor employees will find that this manual sets out a philosophy and standard approach to contract highway and bridge maintenance administration for Alberta. Government staff and Contractors in all regions of the Province can use this document as a reference, training manual, and reminder of how Alberta's roads should be maintained. It is a common-sense, easy-to-read document that explains how the partnering process works between AT and its Highway and Bridge Maintenance Contractors.

Much of the information refers directly to the responsibilities of AT's Maintenance Contract Inspectors and the Contractor (being the Foreman, Contract Technician, Superintendent, etc.) because they are the Province's front line.

1.0.3 BRIDGES

Information on bridge maintenance is covered in the Highway Maintenance Contracts. Section 6 of this manual explains the roles of Alberta Transportation's bridge staff as they administer the minor bridge maintenance programs. Bridge related definitions can be found in this section as well as in Section 6.

1.0.4 DEFINITIONS

This is not an exhaustive list, but the definitions contained here might help the reader of the Contract Administration Manual.

Agricultural Fieldman
An agricultural expert who works for an individual Municipal District or County. Ag Fieldmen are responsible for weed control for their entire municipality and assist the Department and the Contractor in determining what weeds need to be tended to in a given year. They can issue weed notices to private landowners and government agencies if the weeds get out of control.

Alberta Infrastructure (AI)
A government agency that owns provincial buildings/yards. Several maintenance yards are owned by Alberta Infrastructure (and the Contractor leases them). They play a role in monitoring and developing processes that address and minimize ongoing site contamination in many of the Contractors' current maintenance yards.

Appurtenance Inventory Application (AIA)
A TIMS application that allows for the collection and update of appurtenances in Alberta Transportation's right of way.

ARHCA
Alberta Roadbuilders and Heavy Construction Association

AVLS
Automated Vehicle Location System; GPS and sensors in snow plows that track the activities of the plow and facilitates automated billing.

BATG
Budget Allocation Task Group; subgroup of the Operations Process Management Committee (OPMC); deals with the equitable distribution of maintenance funds

Claim (by Contractor)
A claim is a request for additional compensation from the Department for alleged costs he has incurred or losses he has suffered during the performance of his duties under a Contract, when actual circumstances encountered were, in his opinion, at variance with terms described in the Contract.

Claim (by Third Party)
These claims can occur from either real or perceived damage as the result of the actions of the Contractor, the Contractors' agents, or the Department, where there is a real or perceived negligence. Claims can also be received from Subcontractors or suppliers who are dissatisfied either with the amount or timing of payment, or have other issues with warranties, holdback, or related concerns affecting compensation or the firm's reputation in a negative manner.

Construction Engineer (CE)
Assists the Construction Manger in ensuring that the construction program is delivered. Construction Engineers supervise the consultants who prepare designs, tender packages, and provide project management on construction projects.

Construction Manager (CM)
Oversees the construction program in each Region.

Contract Maintenance Area (CMA)
The province has been divided into geographic areas. Each area has been awarded to a Contractor who is responsible for the maintenance of the provincial highway system, as well as

the reserves, ferries, provincial park roads, and water infrastructure in that area. There are 30 CMAs in the province, each with approximately 1000 two-lane equivalent kilometres of provincial highway, plus the Deerfoot Trail Maintenance Area (**DMA**) and Stoney Trail in Calgary and the Anthony Henday Drive in Edmonton. A Maintenance Contract may be as small as a single CMA, but more commonly, a Contract is made up of multiple CMAs, to a current maximum of twelve (12) – as of April 1, 2009.

Development/Planning Technologist
The Development/Planning Technologist (DPT) works from each District office, approving development permits, utility permits, permits for special events, TODS (Tourist Oriented Destination Signs)/Logos signs, etc. Maintenance Contract Inspectors and Field Support Technologists provide field information to this person, often inspecting the area before, during, and after the Work is performed. DPT's also use several TIMS applications.

DFO
Department of Fisheries and Oceans (Federal)

Disagreement
A disagreement is a dispute between the Contractor and Alberta Transportation over application of the Contract Specifications or measurement of quantities in the field. A disagreement should be resolved at whichever level is appropriate. If it can be resolved at the field level, it is generally preferable to do so. If it can't be resolved at a level, it should be escalated to the next level (on both sides).

Escalation should occur if the people involved do not have the expertise, experience, or authority to solve the disagreement. Escalation can also occur if the parties involved cannot achieve agreement at their level. Generally, as the issue becomes more difficult, increasingly senior levels of supervisory personnel/management become involved as they tend to have a wider perspective on the costs/benefits of a course of action, as well as the wider impact the decision may have on their respective organizations. An example of escalation levels could be:

Alberta Transportation	**Contractor**
1. Maintenance Contract Inspector (MCI)	Foreman
2. Operations Engineer	Superintendent
3. Operations Manager	Manager

This varies among Contracts.

Engineer
The person designated by the Minister to administer the 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.

Failure Definition Handbook
This manual was developed by ARHCA and AT as a guideline to determine whether the Work under discussion is acceptable. It supplements the Specifications, but does not supersede them.

Highway Pavement Management Application (HPMA)
HPMA is a database of highway related information. That information is used to help rank Corrective and Preventative Maintenance Programs, as well as develop the provincial rehabilitation program. One of the very important components of information in HPMA is the Surface Condition Rating (SCR) information the operations field people collect.

The HPMA database breaks down the highway network into inventory sections based on the pavement geometrics and construction history. For example, HPMA may have three inventory sections on one highway: one for the two-lane section, one for the same two-lane highway with a climbing lane up a hill, and one for the two-lane highway beyond the top of the hill.

Laneway Code
A description of where a laneway is in relation to the centre line. Laneway codes begin with a designation for either right or left of the centre line, followed by a number designating the lane from the centre line. For more information, see Appendix 1, Linear Referencing System, TIMS Functional Specifications Report. Note that the carriageway codes used in Surface Condition Rating are similar to, but not the same as, the laneway code.

MCI
Maintenance Contract Inspector

Maintenance Contract Management System (MCMS)
Former computer program which generated and tracked Work Orders and related information, and facilitated payment to the Contractor. It was specifically designed for AT for management of the Highway Maintenance Contracts. **MCMS is now obsolete;** it was replaced with Program Management Application (PMA) in April 2007.

Negotiation
Negotiation is the process of determining a mutually agreeable solution to an issue between two parties. This process is typically used to address issues resulting from items not covered by the Contract terms, or where there are several alternative solutions to achieve a desired end result, which have benefits and costs to both sides, and there is a need to identify the best mutual balance of cost/benefit.

Operations Process Management Committee (OPMC)
In support of AT's corporate mission, the OPMC contributes to the safe operation of Alberta's highway network by ensuring that consistent, prompt, and cost effective maintenance programs are implemented.

Group membership consists of:
- all Operations Managers
- the Director of Highway Operations, Technical Standards Branch
- a non-voting member responsible for the various administrative and technical aspects of the group's business
- a Regional Director – executive sponsor

Representatives from other branches of AT or other government agencies, as required, may provide assistance to the group on various matters for which they can provide expertise (e.g. internal auditors, environmental consultants, Alberta Environment, etc.). They may work on sub-committees, or with the OPMC as a whole.

Operations Services Co-ordinator (OSC)
The OSC assists the Operations Manager in the day-to-day administration and delivery of the highway maintenance program within a District.

Program Management Application (PMA)
Replaced MCMS on April 1, 2007. PMA, a component of Transportation Infrastructure Management System (TIMS) is the web-based application used to manage the Work done by the Maintenance Contractor. It handles proposed and draft Work, Work Orders, work sheets, progress estimates, budgets, and reports. The system is used by Contractors and government staff to manage the work requirements and integrates with the contractors internal financial systems.

Program Management Branch (PMB)
Provides support with request for proposals, tendering, new contracts, and changes to existing contracts.

Pavement Preservation Strategy (PPS)
Methods to preserve the pavement surface to slow down its deterioration.

Request for Proposal (RFP)
A process for bidding on a Contract. This process is used by AT to decide which Contractor will be awarded the maintenance Work for a Contract Maintenance Area. More than just pricing is considered in the awarding of the Contract.

Surface Condition Rating (SCR)
Government field staff (or designate) manually rate pavement surfaces in terms of cracking, rutting, etc. and place the information in a database. This information is used for processes such as budgeting and programming.

Segment
For maintenance, a segment is a section of highway used for tracking maintenance Work or recording pavement condition. TIMS (Transportation Infrastructure Management System) uses the term segment for any user-defined portion of highway. These two uses of segments are similar.

For highway maintenance, there are four main types of segments:
- Surface Condition Rating
- Network
- Area
- Any

Surface Condition Rating Segment

A Surface Condition Rating (SCR) Segment is a section of a single provincial highway with the same or similar surface condition. This type of segment may not be shorter than 500 metres, and cannot be longer than two control sections. (An average SCR segment is approximately 8 km long.) The boundaries of an SCR segment may change yearly as the asphalt deteriorates or upgrades are made. SCR segments are used to record pavement related maintenance Work such as crack sealing, patching, and pothole patching.

More information on how surface rating segments are defined can be found in the latest version of the *Surface Condition Rating Manual* (see Appendix 2).

Gravel surface highways can also be broken into SCR segments, based on whether the gravel has been treated for dust control or not.

Network Segment – used in PMA

A network segment is identified using the Linear Referencing System and has a start and end kilometre or an intersection number. Winter segments are a type of Network Segments.

Winter Segment

A Winter segment is a segment used for winter snow removal and ice control tracking. These segments are only used for reporting snow plow truck hours of Work and snow and ice control material usage, and are crucial in reporting with AVLS. These segments are all geo-referenced with GPS.

There are two types of Winter segment naming conventions:

- **Numbered Highway Segment Naming Convention**
  - First position identifies it as a winter segment by a "W"
  - Second two positions identify the CMA
  - Next three positions identify the highway number
  - The remaining two positions are a subsection identifier
    - An example is W1100200; Winter Segment, CMA 11, Highway 002, Subsection 00
- **Non-Numbered Highway Segment Naming Convention**
  - First position identifies is as winter by a "W"
  - Second two positions identify the CMA
  - Next two positions identify the type of segment
    - SH: Shop
    - ST: Stock Pile
    - FL: Fuelling Area
    - PK: Park
    - WA: Water Infrastructure
    - IR: Indian Reserve
    - MS: Métis Settlement
    - ID: Improvement District
    - AR: Access Road
    - SP: Special Area

        - SC: Short Cut
        - RA: Rest Area
        - VS: Vehicle Inspection Station
        - LR: Local Road
        - UK: Unknown (note: an Unknown Winter Segment will appear as W99UK999)
    - The remaining three positions are a subsection identifier
        - An example of a Park Segment is W28PK000; Winter Segment, CMA 28, Park Road, Subsection 000

Area Segment – used in PMA
Area segments identify Districts or CMAs; an area definable by TIMS (shops are not defined in TIMS, so Shop Segments do not exist in PMA). A CMA Area segment involves the entire CMA. It is used to plan and report Work that happens within the CMA, such as line painting and winter road inspections. Sometimes a District Area segment is used as an alternative to CMA Area segments for line painting and to track expenses outside the Contract such as rail crossing maintenance and overhead lighting.

Any Segment – used in PMA
In PMA, these segments encompass any segments that don't fall into the above two categories (Network or Area). They can be identified by start/end kilometres, an intersection number, or a CMA or District. Some examples of Any segments are those for ferry sites, park roads, environmental structures, Vehicle Inspection Stations (VISs), and remote stockpile sites

Traffic Accommodation Strategy (TAS)
Written plans and procedures detailing the traffic accommodation strategies for the Work on or adjacent to the highway.

TIMS
Transportation Infrastructure Management System. It is AT's corporate data repository.

Work Order (WO)
A Work Order is a written or electronic document that defines the Work to be performed by the Contractor, the bid items to be used, the location, and the required completion date. It may include a requirement for reduced response time, based on emergencies or other reasonable scheduling priorities.

1.0.5 CONTRACTS – GENERAL

The Highway Maintenance Contract is a legally binding document between Alberta Transportation and a Contractor. It outlines the maintenance Work to be performed on identified highways, roadways, and other defined government infrastructure, in a given geographic area, at a specified rate of payment.

Initially, each Contract was set up for a five-year period, and in some cases was extended by mutual agreement. Contracts now run for between 5 and 7 years.

AT selects the Contractor for each of the Contract Maintenance Areas through a bid process called Request for Proposal (RFP). For each CMA, AT creates an RFP that outlines what its highway maintenance requirements are and the method that is used to choose the Contractor responsible for the area. Contractors then respond to the RFPs. AT personnel review the proposals and select the Contractor(s) whose response best met AT's requirements.

Care should be used when changing any condition or requirement of a Maintenance Contract, so that the Contracts remain similar from area to area. The ***General Specifications*** section of the ***Standard Specifications for Highway Maintenance*** manual outlines the authority of the Operations Manager and/or the Maintenance Contract Inspector within the Contract. Under most situations, conditions or requirements of a Maintenance Contract cannot be added, removed, or altered without the written approval of both the Executive Director, Program Management Branch (or Director of Tender Administration; a section of Program Management Branch) in his capacity as "The Engineer" and the Contractor.

The Maintenance Contract is legally binding only between AT and a specific Contractor. Conditions of that Contract are not necessarily identical to those in a Contract with another Contractor in another maintenance area. The terms are generally location, work, and contract specific. However, there are exceptions where one Contractor can move beyond the physical area specified in the Contract. For example, during an emergency situation or extreme weather conditions, Contractors may work outside of their physical Contract boundaries to assist in adjacent areas; under AT manager approval.

If the Department required the Contractor do to Work outside of the normal scope of the Maintenance Contract, the Contractor should be fully briefed and asked to identify cost, time, and/or other implications to him doing the Work. Once the scope of Work is clearly identified, an agreement should be reached on how the Work will be performed. Depending on the value and type of work, there are several options that could allow AT to assign the Work to the Contractor:

- the original Contract may be amended and approved by both parties
- a service agreement could be entered into
- a new Contract may be entered into
- the Work may be done as Extra Work

Government personnel involved in making decisions on Contract requirements, payments, standards, etc., must be familiar with the terms and conditions of their particular Maintenance Contract. Any decisions on the Work must be made using the information set out in the Contract that applies to a specific Contractor and that particular maintenance area.

NOTE: The work execution plans, mobilization plan, and any special provisions or negotiated terms agreed to once the Contract has been signed are specific to an individual Maintenance Contract. These agreements may vary significantly from one Contract and maintenance area to another within the Province. Due to the staggering of timing of the RFPs and the extension of

some Contracts, the version of the Highway Maintenance Specifications may vary from one Contractor to another. However, the Department strives for consistency when possible, both in issues negotiated during a Contract and in specifications.

SPECIFICATION DEVELOPMENT: Specifications for maintenance operations were originally developed by the Department in 1995, using the expertise of Department and industry representatives who had experience in given maintenance activities. The specifications have been subsequently modified by joint committees of the Department and Contractor representatives to better capture best practises and to clarify any aspect of the specification which had been unclear or that was causing unnecessary difficulties for the Contractor or for administration by the Department. The Department has also sought to develop Specifications which are less prescriptive regarding the methods of Work that are required and are concerned more with the final end product. Some activities, such as snow and ice control, remain more prescriptive due to the difficulties in reasonably specifying an end product that is clear enough for the Contractor to bid on, that does not increase liability concerns, and that adequately addresses the Department's concerns regarding provision of an adequate level of service for winter maintenance.

As such, the specifications are the primary document for undertaking the highway maintenance Work. However, in some respect they should be considered a work in progress and will continue to evolve to address interpretation/administration issues, to address new technology, to best manage risk, and to address finding the right balance of costs for doing the Work that achieves mutual Department and Contractor goals for quality, timeliness, and safety. Innovation to improve maintenance operations should be considered on an ongoing basis, and technologies that accomplish this should be encouraged. In the long run, it is expected that proven technologies will ultimately end up in future specifications.

1.0.6 HIERARCHY OF DOCUMENTS

When there is a discrepancy between documents in a Maintenance Contract, the following hierarchy of documents should be used, in descending order:

a) Special Provisions
b) specifications amendments
c) applicable appendices contained in the document entitled *Dispute Resolutions Process for Government of Alberta Construction Contracts*, Edition 1, 1997
d) plans
e) general specifications
f) technical specifications
g) mobilization plan
h) work execution plan

If there is a difference between scaled dimensions on plans and the figures written on them, 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.

1.0.7 PARTNERING

Partnering can be described as a somewhat informal, voluntary relationship between Alberta Transportation and the Contractor, which identifies the processes for communicating and resolving issues in a positive manner. Partnering emphasizes the working relationship between parties involved in the Contract. It should not to be confused with the legal partnership set out in the Contract itself.

In partnering, the focus is on working together and building on everyone's strengths to find the best solutions and mechanisms for rapid issue resolution.

In the partnering process, each side has a corresponding responsibility:

- AT is committed to an attitude of co-operation with the Contractors and to treat the Contractors fairly, by placing the risk where it can best be managed.
- AT and the Contractor need to be committed to a relationship of fairness, openness, and sharing concerns, while safe-guarding public interest and safety.

An important part of the effective partnering process is continuous evaluation. This process ensures that the implementation plan agreed to by both AT and the Contractor is proceeding as intended.

NOTE: Although the intent of partnering is to work together to reach mutually-agreed-upon decisions, these decisions must not affect, alter, or replace the conditions of the legal Contract, without the approval at the appropriate level of authority in the respective organizations. It is essential that AT and its partners work well together. Here is a further explanation of the difference between a Contract and a partnering agreement:

- The ***Contract*** is a written, legal document that describes what is to be done, by when, by whom, to which Specifications and standards, etc.
- The ***partnering relationship*** addresses how the parties involved in the Contract work together to fulfil the Contract for their mutual benefit and satisfaction.

Open lines of communication are essential in all aspects of the Contract. Ongoing communication is critical in the following areas:

- safety
- quality
- timeliness
- budgeting process
- ordering Work

Timing of Work is a good example of effective partnering between AT and a Contractor. If AT staff order all spring maintenance done at once, the Contractor would find the task almost impossible; his personnel and equipment would not be able to keep up. However, if the Work is spread out over a reasonable amount of time, the Contractor can do it effectively with a reasonable complement of manpower and equipment.

Consideration of the other person's point of view is the key to developing a good working relationship. Reviewing the Work in a non-confrontational manner, without using adversarial language, is an important aspect of developing the partnership. Treating each other with respect and as you would like to be treated in return, tends to result in better solutions to problems as both sides consider the others' mutual interests. Neither side has perfect knowledge, understanding, or capabilities regarding highway maintenance, so it is important to reserve judgement until all of the appropriate facts regarding the situation are determined and made known to both sides. Both sides of a partnership work hard to achieve their mutual goals: safety, quality, timeliness, cost effectiveness, and profitability, and if this is understood and appreciated, the relationship between partners can be a positive and rewarding one.

1.0.8 PARTNERING MEETINGS

These meetings are usually held annually or as required, within a Contract. The meetings are held to promote the concept of partnering to assist in the resolution of concerns at the lowest level possible. Other things discussed are the health of the partnership, how to solve some general and/or common problems (whether or not these problems are currently occurring in the partnership), and the importance of positive communication skills. The Contractor's employees who attend these meetings could be:

- Senior Management, as appropriate
- Contract Management
- General Foreman/Superintendent
- Area Foremen
- Office Administration

The Department employees who attend these meetings could be:

- Regional Director
- Operations Manager
- Operations Engineer
- Operations Services Coordinator
- Maintenance Contract Inspectors
- Field Support Technologists
- Regional Safety Officer
- Operations Office Administration
- Regional Bridge Manager
- Bridge Technologist
- Bridge Engineer
- Regional Construction Manager
- Regional Infrastructure Manager

The OM and the Contractor's Manager determine the agenda and who should attend the meeting. They may request a facilitator, if appropriate, to keep the meeting focused and to set up groups for round-table discussions. These meetings are designed to allow both sides opportunities to

find workable solutions for any problem areas, and to promote a positive working relationship between the partners.

1.0.9 OPERATIONAL MEETINGS

These meetings are important communication tools between Alberta Transportation and the Contractors. They are attended by the Maintenance Contract Inspectors, the Operations Manager, Operations Engineer, the Contractor's management, Superintendents, and any others who can provide input and insight into the past, present tasks, and future jobs. When necessary, bridge or construction representatives and safety staff may attend these meetings.

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

- Work completed since the last meeting
- Work the Contractor has planned for the next few weeks
- Work the Department plans to issue within the next few weeks or months
- status of Work in progress
- any project, technical, administration, or communication issue or concern
- safety issues or concerns

1.0.10 MANAGEMENT STAFF MEETINGS

Senior management staff from both the Department and the Contractor will participate in a management meeting a minimum of twice per year, or as mutually agreed, to discuss the following types of issues:

- the Department's budget and any budgetary constraints on the Work
- updates and changes in the Contractor's business plan and financial plan
- contract performance measures
- specification interpretations
- partnership relationship
- scope and magnitude of anticipated work for the next 6-month period (summer and winter Work Plans)

The Operations Manager(s), Operations Engineer(s), Contact Manager(s), and Contract Superintendent(s) usually attend these meetings.

1.1 CONTRACT ORGANIZATION AND RESPONSIBILITY

1.1.1 ALBERTA TRANSPORTATION

Operations Process Management Committee (OPMC)
The mandate of the OPMC is as follows:

- Provide support to the Divisional Executive Committee and be committed to working in a team approach with Technical Standards Branch and the Alberta Roadbuilders and Heavy Construction Association (ARHCA) Maintenance Subcommittee
- Co-ordinate on a provincial basis the annual processes that are necessary for efficient and consistent delivery of the maintenance program
- Be the custodian of the Department's maintenance management processes and the Program Management Application (PMA) by:
    - Ensuring that they continue to fit the purpose in an ongoing way
    - Providing a set of priorities to the Department for enhancement of the processes and systems based on user group input, management level need, cost effectiveness, and efficiency
- Maintain linkage between the maintenance management processes and the Transportation Infrastructure Management System (TIMS)
- Identify technology and research projects relating to highway maintenance and have a role in participating in the delivery and evaluation of projects that are undertaken
- Liaise with the ARHCA Maintenance Subcommittee on matters of mutual interest that would benefit both the Department and Maintenance Contractors
- Work with Technical Standards Branch in the development and consistent implementation of the following items as they relate to highway maintenance and operations:
    - Contract specifications and tendering strategies
    - standards, policies, and guidelines
    - roadside management guidelines
- Monitor performance of the highway system and identify improvements and appropriate action plans for implementation
- Provide input into the Department's preservation, rehabilitation, and construction programs

The OPMC is responsible to the **Assistant Deputy Minister, Transportation & Civil Engineering Division**, who, through the OPMC Executive Sponsor, provides overall direction to the OPMC, which is accountable for the successful implementation of initiatives empowered to the OPMC under their Charter.

1.1.2 MAINTENANCE CONTRACTOR

A Maintenance Contractor is the company that entered into a Contract with Alberta Transportation to perform highway maintenance for certain areas in the Province. AT works with the Contractor to schedule the Work. The Contractor is responsible for performing all the Work in accordance with the specifications.

1.1.3 SUBCONTRACTORS

A Subcontractor is a contractor that is hired by the Maintenance Contractor to perform a part of the highway maintenance Work. Only a certain percentage of the Contract is allowed to be subcontracted, and this amount is outlined in the specifications. Alberta Transportation works with the Contractor, while the Contractor deals with the Subcontractor. Approval to subcontract, and approval of the Subcontractor, may be required by AT, depending on the value of the subcontract. The specifications outline the approval process for hiring Subcontractors.

1.2 RESPONSIBILITIES

1.2.1 CLARIFICATION

The duties outlined below are not complete job descriptions. They are just part of the picture. Additional information regarding the authority of Alberta Transportation personnel can be found in the *Standard Specifications for Highway Maintenance*, General Specifications.

No one at AT is authorized to act as Foreman or Superintendent for the Contractor.

Only senior Department officials at AT are authorized to:

- extend or make changes to the Contract (unless otherwise noted)
- alter or waive the provisions of the specifications or plans
- issue instructions contrary to the specifications and plans. (Changes to specifications and plans to achieve desired mutual objectives could be made by agreement of the Engineer and Senior Management of the Contractor for a particular Contract.)

1.2.2 REGIONAL DIRECTOR (RD)

The Regional Director provides direction and focus to budget priorities, safety policies, and Alberta Transportation goals and objectives within the Regions. The RD, through his management team, ensures the communication process between AT and the Contractor works effectively so that maintenance services are consistently delivered throughout the Province.

1.2.3 OPERATIONS MANAGER (OM)

The Operations Manager manages the Contract and keeps Alberta Transportation's executive management informed on the progress of the Work and how it is being performed.

Only the OM is authorized to perform the following duties:

- authorize Extra Work
- approve the rate of payment 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
- provide one-time approval of unit prices for undefined Work included in a specific Work Order
- authorize adjustment of Work Order completion dates

The OM's responsibilities also include the following tasks, which may be delegated as appropriate:

- ensure that AT budgetary and conditional targets for the Contract are achieved
- plan budgets for future Work and prepare realistic forecasting of expenditures

- identify and authorize the Work to be performed
- prepare and approve monthly payments to Contractors
- reject defective material and Work and prohibit any work method or procedure that would result in a finished product that fails or will fail to meet the standards required by the specifications or plans
- give final acceptance of any portion of the Work
- encourage the development of, and work with, the Contractor to implement innovative technologies to improve the cost, level of service, or delivery of highway maintenance operations
- inspect all Work done and material provided. The inspection can extend to any part of the Work and to the preparation, fabrication, or manufacture of the material to be used.
- suspend the Work with cause
- approve Subcontractors
- attend Partnering and Operational Meetings
- resolve or assist with the resolution of any disputed contractual issues between AT staff and the Contractor

Safety-related duties:

- support the development and implementation of AT safety standards and guidelines for Maintenance Contractors working for AT
- conduct the pre-commencement meeting prior to the start of the Maintenance Contract
- assist in the resolution of Occupational Health & Safety (OH&S) issues with the highway maintenance Work or disputes between Contractors on AT Maintenance Contracts
- monitor public safety issues, bring them to the attention of the Contractor, and work together to ensure appropriate resolution
- liase with AT staff to ensure safety issues that have been identified are dealt with promptly and appropriately
- resolve any disputed safety issues between AT staff and the Contractor
- complete the Annual Maintenance Contract Health & Safety Review with the Contractor's designated representative
- forward copies of all specified health and safety reports to the Regional Safety Officer

The OM will exercise such additional authority as may, from time to time, be delegated to him by the Engineer.

The OM is not authorized to extend or make changes to the Contract, alter or waive provisions, or issue instruction contrary to the specifications or plans. The OM is authorized to provide interpretations regarding the administration and management of the specifications and plans in conjunction with the OPMC, its committees, and the Contractors, to ensure that there is a reasonable level of consistency in the interpretation of the specifications across the province. The Contract Administration Manual is intended to provide some assistance in this role regarding various specification interpretation issues that have been encountered in the past.

1.2.4 OPERATIONS ENGINEER (OE)

The Operations Engineer assists the Operations Manager in the day-to-day administration and delivery of the highway maintenance program within a District. The OE may perform some or all of the following duties while assisting in the administration of the Maintenance Contract.

- attend Partnering and Operational Meetings
- assist the Maintenance Contract Inspector in defining the scope of Work for projects that are large in scale, complex, or otherwise difficult to assess
- prepare quantity and cost estimates for specific projects
- co-ordinate Work Orders among MCIs so that the Contractor is able to allocate appropriate resources to perform the Work on schedule
- ensure similar activities are ordered in a consistent manner in each Contract Maintenance Area
- monitor quality control/quality assurance measures required for specific Work activities
- track Contract and administrative expenditures on a monthly basis and assist the OM in forecasting year-end expenditures
- formulate budgets for all Work activities, matching funding allocations to infrastructure priorities
- monitor Contractor performance in terms of efficiency, quality, timeliness, and safety, and provide reports to the OM
- encourage the development of, and work with the Contractor to implement innovative technologies to improve the cost, level of service, or delivery of highway maintenance operations
- help resolve disputes between the MCI or other Alberta Transportation forces and Contractor
- work with PMA in terms of budgeting and record keeping
- review progress estimates in PMA
- other duties as delegated by the OM

Safety –related duties:
The OE has similar duties to the OM, plus he can assist in the resolution of disputed safety issues.

1.2.5 OPERATIONS SERVICES COORDINATOR (OSC)

The Operations Services Coordinator assists the Operations Manager in the day-to-day administration and delivery of the highway maintenance program within a District. The OSC may perform some or all of the following duties while assisting in the administration of the Maintenance Contract.

- attend Partnering and Operational Meetings
- assist the Maintenance Contract Inspector in defining the scope of Work for projects that are large in scale, complex, or otherwise difficult to assess
- prepare quantity and cost estimates for specific projects
- co-ordinate Work Orders among MCIs so that the Contractor is able to allocate appropriate resources to perform the Work on schedule

- ensure similar activities are ordered in a consistent manner in each Contract Maintenance Area
- monitor quality assurance/quality control measures required for specific Work activities
- track Contract and administrative expenditures on a monthly basis and assist the OM in forecasting year-end expenditures
- formulate budgets for all Work activities, matching funding allocations to infrastructure priorities
- monitor Contractor performance in terms of efficiency, quality, timeliness, and safety, and provide reports to the OM
- encourage the development of, and work with the Contractor to implement innovative technologies to improve the cost, level of service, or delivery of highway maintenance operations
- help resolve disputes between the MCI or other Alberta Transportation forces and Contractor
- work with PMA in terms of budgeting and record keeping
- review progress estimates in PMA
- provide technical leadership in the area of Information Technology and organize data management activities
- provide support in regard to provincial highway and municipal construction projects and assist with long range, functional, network and roadside planning.
- other duties as delegated by the OM

1.2.6 MAINTENANCE CONTRACT INSPECTOR (MCI)

Reporting to the Operations Manager or Operations Engineer, the Maintenance Contract Inspector is responsible for administering the road maintenance program for a Contract Maintenance Area (CMA), ensuring that highways are maintained to Alberta Transportation standards and guidelines. The MCI oversees and monitors road maintenance programs to ensure that Work carried out by the Contractor meets the contractual agreement and specifications.

The following is a partial list of the MCI's duties:

- identify and/or approve Work identified by the Contractor and authorize it by issuing Work Orders to the Contractor. This involves working with the Contractor to establish quantities, scheduling, and reviewing planned work procedures.
- inspect Work for compliance with the specifications and completion within the time frames allocated
- identify and monitor warranty requirements
- verify, recommend acceptance/rejection, and authorize payment for completed Work, following AT guidelines, using PMA
- assist the OM in managing expenditures in their CMA
- finalize the quantities on the Crew Work Sheets and review these with the Contractor. When required, audit the Work, verify, and as reasonable, question both the quantity and quality of the Work to ensure Department and Contractor interests are mutually achieved
- provide Work quality and quantity information to the OM monthly, so that a progress estimate can be issued

- provide input to the OM for the annual Work quantities and budget
- negotiate Extra Work with the Contractor, then submit it to the OM for review and approval
- encourage the development of, and work with the Contractor to implement innovative technologies to improve the cost, level of service, or delivery of highway maintenance operations
- Review specifications with the Contractor, when necessary, to seek to clarify expectations before the Contractor starts the Work
- help develop or modify new or existing specifications
- attend regular meetings with the Contractor
- observe any other Work under AT's jurisdiction for compliance to specifications and standards, and to maintain or increase the safety of motorists using the highway (e.g., is the guardrail installed to the proper height or is the cable installed properly)
- assist in the administration of service agreements and small Contracts outside of the Highway Maintenance Contract
- collect and/or update appurtenance data in Appurtenance Inventory Application (AIA)
- other duties as delegated by the OM

The MCI and FST share the following safety duties:

- review over-all safety (e.g., on-the-job signage)
- periodically monitor the safety performance of the Contractor's personnel in the field
- periodically monitor, then document, arrangements made for public traffic while maintenance is in progress (Traffic Accommodation Strategy)
- attend the pre-commencement meeting with the Contractor
- periodically attend the Contractor's monthly safety meetings as well as safety meetings that take place before any major Work phases
- advise the OM and Regional Safety Officer of any unresolved safety issues
- report any health and safety violations by the Contractor's personnel to the Contractor as soon as reasonably possible, so that the violations can be corrected. In some cases, the Contractor may be required to provide an action plan that will set out how the problem can be solved. The quicker the Contractor is aware of safety concerns, the quicker they can address them. A short discussion with field personnel followed by a discussion with the Contractor's Superintendent or corresponding supervisory personnel is generally appropriate.
- through the RSO, request assistance from an Occupational Health and Safety Enforcement Officer from Regional Management Division, Alberta Employment and Immigration. This can only be done when both of the following conditions are present:
  - the Contractor has known violations of health and safety regulations noted against him
  - danger is <u>not</u> imminent
- take the following action when the Contractor fails to correct a hazard or fails to comply with an order by an Alberta Employment and Immigration, Occupational Health and Safety Enforcement Officer:
  - advise the OM of the existing conditions, and request advice regarding appropriate response

- shut down the job site until the safety issue has been resolved (where there is imminent danger). Contact and review the concern with the Contractor's Superintendent and, as appropriate, the field personnel to ensure that the matter is addressed in a timely and appropriate manner.
- where imminent danger is not a concern, review the issue with the Contractor's Superintendent and where appropriate, field personnel, so that appropriate measures are taken to address the concern in a timely and appropriate manner. (Where field personnel have not complied or do not comply with requirements, Contractor supervisory personnel may be required to intervene.)
- contact the RSO for advice
- contact the Regional Office of Alberta Employment and Immigration to advise the Regional Enforcement Office of the non-compliance, if recommended by AT management/safety personnel

1.2.7 FIELD SUPPORT TECHNOLOGIST (FST)

The Field Support Technologist assists the Maintenance Contract Inspector.

The FST is authorized to perform the following:

- provide technical advice and support on matters relating to both the survey and materials testing disciplines of road construction and maintenance
- either arrange for, or perform, quality assurance as required
- monitor quality assurance/quality control performed by the Contractor
- assist in interpreting the results of quality assurance tests for the Engineer
- review Work for warranty requirements
- monitor the Contractor's performance
- advise the MCI and/or Operations Manager when the terms and conditions of the Contract have not been followed
- monitor construction or maintenance projects for potential future maintenance concerns
- periodically review on-site construction Work for safety
- suspend Work due to significant worksite hazards until the safety issue has been resolved (where there is imminent danger)
- assemble fatality reports
- collect Surface Condition Rating data and inventory information
- survey stockpiles
- collect and/or update appurtenance data in Appurtenance Inventory Application (AIA)
- assist Development Planning Technologists/Operations Support Coordinators
- perform all aspects of the MCI's work, in the absence of the MCI
- assist MCIs when necessary
- assist in other areas, as required

The FST will exercise such additional authority as may be delegated to him by the OM.

1.2.8 REGIONAL SAFETY OFFICER (RSO)

The Regional Safety Officer performs the following duties pertaining to operations:

- evaluate how maintenance activities may affect the motoring public and advises on appropriate signing
- ensure that Alberta Transportation personnel involved in the Maintenance Contract understand their role as defined in the OH&S Act, especially for the Prime Contractor's responsibilities
- assists in discussions with the Contractor regarding roles and responsibilities
- advise the Contractor of identified safety deficiencies
- conduct periodic inspections of worksites, equipment, and facilities and report any health and safety violations to the Maintenance Contract Inspector/Operations Manager/Operations Engineer/Operations Services Coordinator
- monitor collision reports. Ensure that any deficiencies that might have contributed to the collision are addressed.
- investigate any incident where there has been a fatality, serious injury, or excessive third party property loss occurring at a maintenance work site
- review the Contractor's safety performance
- review monthly and yearly safety reports
- periodically attend Contractor's safety subcommittee meetings
- attend pre-commencement meetings and periodically attend the Contractor's monthly safety meetings
- periodically (or as requested) attend the Contractor/AT Operational and Partnering Meetings
- in cases of imminent danger, order Work to stop until it is safe for it to start again
    - serve as the AT advisor on all safety related matters

1.2.9 THE BRIDGE SECTION

The Regional Bridge Section normally consists of a Regional Bridge Manager, Bridge Engineer(s), and the Bridge Technologist(s) who deal with all aspects of bridge Work occurring within the Region, including, but not limited to:

- construction
- rehabilitation
- maintenance
- inspections
- special programs (i.e. ultra-sonic inspections, paint inspections, copper sulphate electrode (CSE) chloride testing, etc.)
- scheduling and programming

The following personnel are listed in the order that the Contractor generally deals with them.

The ***Bridge Technologist*** has the most involvement in the day-to-day administration and delivery of the bridge maintenance Work. The Bridge Technologist deals with the Contractor's Bridge Superintendent (or representative) regarding all aspects of the Work.

The ***Regional Bridge Manager*** oversees the operation and administration of all bridge activities, and has final approval before any bridge Work is initiated.

The ***Bridge Engineer*** is usually involved in non-maintenance activities, but is a valuable resource providing engineering expertise.

1.3 MAINTENANCE CONTRACT INSPECTOR'S DIARY

1.3.1 CONTENTS

The Maintenance Contract Inspector must maintain a daily diary outlining his interactions with the Contractor and all other aspects of his work day. If needed, these diaries can be used in disputes or litigation. It is also important that the MCI keep a record of all e-mail and other correspondence with the Contractor and the general pubic.

The entries must be made by the MCI, or in his absence, the person monitoring the Contractor. Photos can add an extra dimension of proof to the diary. Cameras should have a date stamp. Pictures from a digital camera may be admissible in court, provided they have not been tampered with; this must be proven.

Daily entries should contain the following information (if known):

- weather
- location of Contractor's Work area(s) and description of Work underway
- instructions issued orally to the Contractor
- a record of visits from the Operations Manager and other officials, as well as resulting instructions or decisions
- changes from Work Order quantities, and an explanation of the reason(s)
- irregularities on any item
- explanations of incomplete field records
- explanations of defects and when they were rectified (provide photos)
- general progress of the Work and an account of extreme difficulties encountered by the Contractor (provide photos)
- special notations of items relating to Extra Work, including identification of Contractor/equipment
- Contractor's claims, intent to claim, complaints, disagreements, etc. (provide photos if applicable)
- any significant events as they happen
- discussions or dealings with property owners/public
- discussions or dealings with officials of municipalities
- record of events that could affect the Contractor's production
- record of collisions within the Contract limits and a record of conditions at the time of the collision if known (photos required), including description of all pertinent signing in place at the time
- discussions with Contractor with regard to Work schedules and quality of Work
- traffic accommodation, detours, construction signs, flag persons (provide photos if applicable)
- location and quantity of Work done by the Contractor

1.4 SAFETY

1.4.1 OCCUPATIONAL HEALTH & SAFETY

When a Contractor signs the Contract for the maintenance area, he becomes the Prime Contractor as defined by the Occupational Health and Safety Act. http://employment.alberta.ca/SFW/295.html The Contractor must establish and maintain a health and safety system so that his employees and Subcontractors comply with the safe work practices and regulations set out in the Act.

NOTE: In cases of imminent danger, the Field Support Technologist, Maintenance Contract Inspector, Operations Services Coordinator, Regional Safety Officer, Operations Engineer, Operations Manager, or any other knowledgeable Alberta Transportation representative can order the Work stopped until it is safe for is to resume. If the Contractor does not comply, the OM needs to be advised immediately.

1.4.2 PUBLIC SAFETY REQUIREMENTS

Alberta Transportation and the Contractor need to ensure that all Provincial Highways and roads under Departmental jurisdiction are kept in the safest possible condition for the travelling public, allowing for a reasonable response time to address the concern. Some of the most common safety issues/practices are:

- repairing potholes and highway failures in a timely manner. (These areas are to be appropriately marked as soon as they are identified or as soon as reasonably possible thereafter, with flags, red diamonds, temporary signs, or a combination thereof, to make the travelling public aware of hazards until they are repaired.)
- erecting critical regulatory signs such as stop and yield (may be a temporary installation until a permanent support can be installed)
- performing minor repairs such as resetting traffic signals from flash, or to flash if there is a malfunction with the signals, or to set up 4-way stop signs until the signals can be repaired
- removing snow and ice in a prioritized and timely manner, keeping in mind road, traffic, and weather conditions on a specific road and keeping required records of the snow and ice removal
- reporting to Alberta Motor Association, and/or RCMP and/or radio stations of any significant changes in the highway condition as a result of weather changes or natural disasters
- removal of debris and/or dead animals that are a hazard to the travelling public
- ensuring Work areas are safe. Considerations include (but are not limited to) traffic control, properly dressed and trained flag persons, good visibility and sight distances to the Work area, etc.
- ensuring that collision sites are controlled. Considerations include working in concert with emergency response forces.

The Maintenance Contract Inspector/Field Support Technologist/Bridge Technologist needs to be familiar with the Contractor's Safe Work Procedures, as they may impact public safety.

1.4.3 SAFETY TRAINING

All Alberta Transportation staff need to review the safety plan that the Contractor submitted in his request for proposal (RFP). This should be done while preparing for the upcoming season. (e.g. Read the safety plans for crack sealing in the spring and snow plowing in the fall.)

All Work done by the Prime Contractor needs to be performed following the Occupational Health & Safety Act and regulations, as well as applicable AT and Contractor specifications, guidelines, policies, and standards. The Contractor becomes the Prime Contractor for all respective Work activities and Work sites when doing Work under the Contract.

In general, safety at the job site is the Contractor's responsibility. If a Work site has two or more Contractors, it is the responsibility of the Prime Contractor's personnel to ensure that the Work is conducted in such a manner to create a safe environment for themselves, other employees, and the travelling public. It is also the responsibility of the Prime Contractor to ensure that any Subcontractors working on the same site as them have an acceptable safety plan.

The Contractor is expected to have mandatory safety training for his personnel, which will vary according to the employees' roles. Some examples of applicable safety courses are:

- Flag person training
- WHMIS (Workplace Hazardous Materials Information System)
- first aid
- TDG (Transportation of Dangerous Goods). This is mandatory if personnel are transporting dangerous goods.

The following examples of safety courses are not mandatory, but enrolment depends upon the duties of the Contractors' personnel:

- snow plow awareness (should be mandatory for new snow plow operators)
- defensive driving and operator training modules, such as those which were used by AT for its operator training program prior to 1996
- cutting torch training
- training for cleaning up avalanches. Anyone working in avalanche areas is to carry the appropriate emergency location devices, programmed to the correct frequency.

1.4.4 SAFETY REPORTING

The Contractor must submit the following reports, as required:

- Accident Notification - incident report involving third party and/or Contractor's equipment, as per General Specifications
- Monthly Health and Safety Report - these are monthly summary reports of safety meetings and reportable incidents

- Annual Maintenance Contractors Health and Safety Report - these forms are completed in April of every year, for the preceding fiscal year
- Year-End Health and Safety Summary – these forms are completed for the preceding calendar year.

Forms need to be submitted to the Regional Safety Officer or the Operations Manager. Each District decides who is responsible for receiving and reviewing reports.

AT personnel must complete the following form, as required:
- Motor Vehicle Traffic Collisions Occurring In Maintenance/Construction Zones

These forms are in Appendix 3.

1.4.5 DUE DILIGENCE

Due diligence means taking reasonable measures to protect from harm all those who could be expected to be affected by the Work being performed. It is a standard by which employers can judge the content and effectiveness of their health and safety programs.

Due diligence can be used as a defence under the law, but it can only be used when appropriate health and safety policies, practices, and procedures are created, implemented, and enforced in the workplace.

From Alberta Transportation's position, there are two elements to due diligence:
- AT has the ultimate responsibility for the maintenance of the highway and the safety of the travelling public. AT must not jeopardize the safety of the public.
- AT and the Contractor must act with due diligence when inspecting the condition of the highway and the status of the Contractor's worksite to ensure the Work is being performed in accordance with the appropriate specifications, policies, and procedures.

Employers (and government departments) need to be able to prove that they do all that is reasonably possible to ensure that the workers (or public) are protected as they carry out their tasks. This is done through:
- developing policies, practices, and procedures (developed by the employer of whoever does the Work) for duties that need to be performed
- developing training programs and training employees to perform their jobs correctly, safety, and effectively
- monitoring and measuring effectiveness of policies and procedures
- communicating information on potential hazards
- auditing work
- developing accident investigation and reporting procedures
- documenting these safety measures

In routine operations such as snow removal, the Contractor has specifications, guidelines, and standards from AT that must be followed. The Contractor is obligated to meet these specifications, guidelines, and standards, and to otherwise seek to use good judgement in the performance of the Work when the available documents do not provide clear guidance on the actions to take. AT should inspect the Work and document the results of the inspections.

Due diligence by all staff is important – especially when public safety could be jeopardized.

See Appendix 4 for Alberta Transportation's Protocol for Owner's Due Diligence for Winter Operations, as noted in the Severe Winter Storm Task Group's Final Report.

SECTION 2 HIGHWAY MAINTENANCE - GENERAL

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2.0 LIAISON REQUIREMENTS

2.0.1 MEDIA

Often the media will contact local Alberta Transportation or Contractor employees for information. If the question is in regards to day-to-day operations and the employee is knowledgeable, the information may be provided by either the local MCI or the Foreman. Any inquiries in regards to work planning, levels of service provided, highway maintenance required, construction schedules, etc. must be forwarded to the location Alberta Transportation District Office for reply. Any questions in regards to liability (i.e. windshield claims) should be forwarded either to the Maintenance Contractor or Department manager.

Only facts and public policy should be stated to the press. Personal opinion should not be voiced and judgment should not be passed on any issue, particularly about the Contractor, the Minister, or any local, provincial, or federal policy. It is not wrong to admit you are not the best person to answer the media's question – it is smart.

Typical examples of the information requested are:

- collision and road closure information
- names of local clubs participating in the highway clean-up programs
- information on how pedestrian-activated crosswalk signals or traffic lights are timed

If you are unsure of an answer, refer the media to the corresponding OM who will then either answer for the Department or Contractor, or refer the issue to the Department's Communications Branch (780-427-7674). The staff in this Branch has been trained for this type of Work. If you provide the Communications Branch the information, they can provide the words for a response in a manner that is less likely to be misinterpreted.

AT employees must complete a media contact form immediately after an interview and submit it to the Operations Manager and others as noted on the bottom of the form. See Appendix 5 for the Media Contact form.

After a Contractor speaks to the media, they should notify their Department Operations Manager immediately to relay the questions and responses.

2.0.2 EMERGENCY ROAD CLOSURE

Since road closures usually happen unexpectedly, good communication has to exist between Alberta Transportation, the Contractor, the Royal Canadian Mounted Police (RCMP), the Alberta Motor Association (AMA Road Reports), the media, and the local levels of government. Procedures need to be clear and non-conflicting so that the motoring public is not inconvenienced more than necessary.

Before the start of the winter, Contractors and the Department must update and exchange their contact lists. Lists should also be updated when changes in personnel occur.

Road Closures (Short-Term Emergency)

Short-term emergency road closures do not require AT authorization, but do require AT notification. They are generally temporary in nature (usually lasting less than an hour, although they may be as long as four hours) and can be handled by the RCMP with some assistance from the Contractor.

Emergency road closures are typically used to clear away damaged vehicles after a highway collision, to remove a hazard from the road or right of way, or for the RCMP to complete their collision investigation. The removal of vehicles from ditches during storm events should be discouraged as this activity may create a safety hazard to the other road users. To facilitate this, the RCMP can implement a "Tow Ban" for short periods of time.

It may be necessary at times to provide traffic control while the problem is being corrected. If the road needs to be closed for longer than one hour, then consideration should be given to a long-term road closure.

Road Closures (Long-Term)

Long-term road closures require the approval of the OM for the area affected. In his absence, the Regional Director would approve it.

As a rule of thumb, AT will consider closing roads during a snow event when visibility is reduced below 75 metres, lasts longer than 20 minutes, and conditions are not expected to improve in the near future. Roads are generally not closed for naturally occurring events such as fog, although severely reduced visibility conditions from any source may warrant closure. The OM may use his discretion to close the road to minimize the potential for collisions, or, if collisions have already occurred, to minimize the potential for additional collisions to occur. This may also apply to other natural or manmade concerns such as smoke, dust storms, extreme ice, or extreme snow conditions, where significant hazards to motorists can exist. One challenge is that the location of these concerns could rapidly change in an area, making it difficult to determine how and where to respond.

Communication between adjacent Districts should be undertaken for continuous closures of all affected sections of a particular highway so motorists aren't inadvertently trapped.

Safety considerations for the Contractor, the public, and emergency agencies should be considered and addressed when identifying the need for closures or warning signs. For example, if the visibility is so poor that signs or road closures are warranted, it may be too dangerous for the Contractor to drive through the hazardous conditions to place signs, barricades, and other traffic control on the other side. As the Contractor mobilizes the signs and barricades from the nearest suitable shop, the anticipated length of the poor visibility event needs to be considered relative to the time it will take to set up the road closure and/or warning devices. Also, during winter operations, consideration needs to be given to whether it is a higher priority for the Contractor to maintain snow and ice control operations, or to man a road closure.

Roads might also be closed for such situations as avalanches, flooding, road or bridge wash-outs, or other significant physical risks to the public, based on the condition of the highway or bridges or concerns in or adjacent to the right-of-way. When the road is closed for a physical problem involving a risk to the public, the OM does not have to approve the closure, although he does need to be notified. He may also need to make a judgment call regarding the degree of risk involved versus measures required to mitigate it (signs and traffic control, temporary repairs, etc., versus road closures).

The reason for the road closure request needs to be confirmed – is it due to the physical condition of the road or bridge, for a risk in or adjacent to the right-of-way, or for poor visibility conditions?

The request for the road closure generally comes from the Contractor or the RCMP. Road closures need to be coordinated among all bordering Contract Maintenance Areas and among OMs. If the RCMP did not originate the request, they must be notified of the closure by the OM or his designate.

During a winter storm situation, AMA, the Contractor, Communications Branch, and local radio stations should be notified of road closures. If the closure is thought to be long-term, AT should notify Alberta Motor Association, Communications Branch, and the radio stations and newspapers, or work with the Contractor regarding notification procedures for the appropriate agencies and media outlets. The OM should be updated regularly so that notification can be made to the Assistant Deputy Minister, Regional Director, and Communications Branch as necessary. If the closure is for more than a few hours, then affected towns should be notified so that they may put their own Emergency Plans into effect if required.

Signs and barricades may be required so that the public is aware of the closure. The RCMP officers may man the barricade locations for the first hour or so, until the Contractor can mobilize his staff, if directed to do so by AT. Each site has to be analyzed on its own merit to determine whether the barricades need to be staffed. The OM makes this decision. Also, as noted above, if the Contractor is undertaking winter maintenance operations, a decision needs to be made regarding whether the priority is for the Contractor to continue with the winter maintenance Work, or man barricades and control traffic. In some areas, assistance to man barricades may be available from Commercial Vehicle Enforcement.

If the closure is likely to be a long one, then barricades should be placed so that services such as hotels and restaurants are available to the travelling public, and so that there are reasonable places for the public to wait safely until the closure is lifted.

It is not generally advisable to name a detour route if the closure is weather-related, because the detour route then becomes the responsibility of AT. However, AT dedicated an Emergency Detour Route along Highway 2 between Calgary and Edmonton and that could be used if appropriate.

Before AT staff decides whether traffic should be re-routed (detoured) around the road closure, the following should be considered:

- If the road has been closed because of blowing snow, dense smoke, etc., the same conditions may exist on any detour road, too. Sending traffic down the detour road may result in the potential for liability if traffic becomes stuck or collisions occur and motorists suffer injuries and/or vehicle damage as a result.
- The road chosen for the detour may not be able to accommodate the amount or size of traffic that would be re-routed.
- Permission needs to be obtained from the level of government that maintains that road if it is not under AT's jurisdiction – for example, the road could be the responsibility of a County or MD. AT staff should ask permission from the local authorities as early as possible. The local experts know their roads best and there may be a reason that one road should not be selected. (i.e., restricted bridge, surfacing structure, road bans, etc.). Any damage done to the detour route roads would be the responsibility of AT.
- When setting up a detour, the use of a programmable message board should be considered. Ensure that the message on display is clear and easily understood by the public.

2.0.3 UTILITIES

There are lines from internet, telephone, power, cable, water, and pipeline companies buried in the road rights-of-way throughout Alberta. The locations of these lines must be identified before any digging or drilling is performed.

If a Contractor breaks one or more of these lines, it could be dangerous to the workers and the public. The breaks can also be disruptive to customers and expensive to fix.

Alberta One-Call is a non-profit association that relays requests for marking buried cable and utilities to its member companies. About 1/3 of applicable Alberta companies are members, so Contractors may still have to call individual companies that are not members of the association to mark cable or pipeline locations. Other private utility location companies may also need to be contacted for the location of utilities.

Alberta One-Call's (2009) phone number is: 1-800-242-3447 and their website is www.alberta1call.com.

Digging or drilling may only start after the appropriate personnel have marked where the buried lines are located. The MCI or FST should perform spot checks to ensure this is done.

Mowing Contractors should be advised to watch for indications that temporary phone lines have been placed above ground in the ditch.

It is much easier to discuss potential utility problems ahead of time than arguing over claims of cut cable after the fact.

AT has utility infrastructure of its own, primarily power provided to lighting and other highway infrastructure such as flashing lights on signs, Road Weather Information Stations (RWIS), traffic counters, and weigh in motion scales. It should be noted that AT is **not** a member of Alberta One-Call, and that the location of many of these utilities are not definitely known, so they need to be specially located if Work is required in the vicinity. For department owned utilities, plans may be obtained from the department (if available) to assist a third party locator to find the underground components.

2.0.4 LOCAL AUTHORITIES

Alberta Transportation staff needs to maintain good working relationships with municipal districts, counties, towns, etc. Here are a few examples of areas of mutual concern where the staff at these different levels of government should cooperate:

- clearing snow at intersections and through towns
- sweeping and cleaning medians
- line painting and message painting
- signs
- vegetation control

In 2001, AT became the road authority for the former Secondary Highway system (3-digit highways). Communication with the local municipalities and counties is essential to ensure that they are aware of what to expect for Level of Service (LOS). For additional information on LOS, refer to the *Highway Maintenance Guidelines and Level of Service Manual (June 2000).* http://www.transportation.alberta.ca/Content/docType34/Production/los_manual.pdf

Local municipalities are allowed to enhance the LOS provided by the Contractor at no cost to the Department. Formal agreements with AT need to be undertaken for liability reasons, and so the local Maintenance Contract Inspector, Foremen, and municipal maintenance staff are aware of all ongoing operations so as not to inadvertently interfere with each others activities. See Appendix 5 for a copy of the "Municipality Access and Work Agreement".

2.0.5 PUBLIC CONCERNS

When any Alberta Transportation or Contractor staff member receives a concern from the public on the level of maintenance, perceived lack of maintenance, or regarding a specific activity, this is the recommended procedure to follow:

a) listen to the concern,
b) advise the person that you will investigate their concerns and get back to them,
c) record their name and phone number so the call can be returned/answered,
d) if required, obtain additional information, and
e) if unsure of the response for any reason, contact the corresponding Operations Manager.

It is inappropriate to place blame on the Maintenance Contractor or to accept liability on behalf of the Department. Stick to the facts and avoid expressing opinions. If the concern is of a

political nature, advise the Operations Manager on the course of action taken, or forward it to him to handle.

If the concern has come through the Department's Minister's office, it could be necessary to draft a reply that requires the Minister's signature (an Action Request/AR). Discuss this with the Department OM. This request is best handled by the OM who may require input from the MCI in order to coordinate a response.

The Contractor is required to maintain records and provide information regarding calls received by the public to the Department upon request.

The procedure for how do deal with damage claims from the public is outlined in section 3.8.6 of this Contract Administration Manual.

2.0.6 PERMITS

It is the Contractor's responsibility to obtain all necessary approvals and permits before any Work is started. The Contractor must be able to produce the permits, should they be required.

These permits could include, but are not limited to:

- permission from Band Councils to enter Indian Reservations to complete Work projects (Department assistance may be required)
- Transportation of Dangerous Goods permits
- permits associated with weed spraying (i.e. close to water courses, etc.). Check with the agricultural fieldman and the regulations for the actual distances.
- Environment or Department of Fisheries and Oceans permits for any Work done near or in a watercourse. (The permits related to bridge maintenance activities are discussed in Section 6 of this Contract Administration Manual)
- permits for extended hours of operation for snowplow operators in the winter season, if applicable
- permits for burning
- permits for water removal
- permits for working in ditches leading to fish bearing streams

These approvals could change from one geographical area to another in the Province. Check with local authorities, such as the Department of Fisheries and Oceans or Alberta Environment, to discover which permits are required in the region.

2.0.7 LIAISON AND COORDINATION WITH CONSTRUCTION PROJECTS

Maintenance Contractor personnel performing highway inspections, Maintenance Contract Inspectors, and Field Support Technologists are the "eyes and ears" for the Bridge and Construction Technologists, Engineers, and Managers, as well as the Regional Safety Officer (RSO).

If an MCI or FST sees something unsafe with signing, flagging, or work practices on construction or bridge projects, he should advise the Project Sponsor (Construction Engineer or Construction Manager). If there is imminent danger, stop and advise the Consultant or Contractor on site. If unsure, ask the RSO, Operations Manager, or Project Sponsor.

Liaison with the Consultant and/or Project Sponsor is beneficial on a construction project. Some times Work like signing, guardrail, or appurtenances may be stripped out of a construction contract, and the Operations staff need to get this Work done through the Maintenance Contract.

At times, additional maintenance Work may be required if a Provincial Highway is used as a haul road or for the portion of the road that is not under construction yet. Operations may be required to do this additional Work. With coordination through the Project Sponsor, construction funding may be available to assist with the additional maintenance Work required. Well before Work commences, Operations staff will assist in task identification, design details, and the definition of project limits.

If a construction project is going to carry over to the next year, it is advisable to have a discussion with the Project Sponsor and/or Consultant in the fall to ensure that the roadway is left in a condition where it is safe to operate snowplows. Proper arrangements need to be made for the ongoing maintenance of any construction-related signing. A winter shut down meeting with the Project Sponsor, OM/OE/OSC, MCI, Consultant, and Construction Contractor should be conducted prior to the Construction Contractor departing the site. Special arrangements for payment may have to be arranged if the maintenance activities fall outside of the terms of the existing construction or maintenance Contract.

Also, in the longer term, completed Construction projects should not be left in a condition where there are hazards to snowplows. Some issues that can arise are the steepness of the asphalt sideslope immediately off the shoulder of the asphalt road surface. If a steep slope is left on the asphalt sideslope and a snow plow puts a wheel over the edge, there us an increased likelihood that the snow plow will be drawn into the ditch and roll over. The steepness of the sideslopes further down the slope is also a potential issue in terms of increasing the risk to snow plows. Another common risk is the condition of joints between pavement lifts or patches: they may have a “lip” which the snow plow can catch, either damaging the plow and/or directing the plow truck into traffic or the ditch where it can roll over.

It is important to seek answers for any concerns early in the process and through the course of the Work, since the Department will be maintaining the roads, guardrail, other appurtenances, etc. upon completion of the project. If a problem occurs after the Construction Contractor has moved off site, contact the Project Sponsor to determine if the repair Work is covered by warranty under the construction Contract.

The OM is to receive a work schedule and an emergency contact list for the construction project.

2.0.8 CARING FOR ALBERTA'S HIGHWAYS & ANNUAL HIGHWAY CLEAN-UP

The ***Caring for Alberta's Highways Program*** allows a group/company/individual to adopt a section of highway (3-5 kilometres in length). Any group, club, or individual is eligible to participate by contacting the district coordinator. Adoption is for a minimum of 3 years, with an option to renew. A sign is posted at the beginning of the highway section identifying the group caring for it. Ordering of the sign may either be carried out through the maintenance contractor or directly by the program's coordinator. In either case, a Work Order for installation through the Maintenance Contractor will be required.

The group agrees to pick up litter on this section at least once per year. The clean-up may be scheduled any time during the summer except on the same day as the Annual Highway Clean-Up (which is usually the first Saturday in May).

Alberta Transportation provides the identification signs, safety vests, and garbage bags required for the clean-up, and the participants provide the volunteer labour and are required to carry liability insurance. Refer to the *Alberta Highway Clean-Up Event Training* Manual for specific requirements. The Department's program coordinator ensures that proper insurance is in place. Participants are required to contact the Contractor's maintenance personnel in their area one week before the scheduled clean-up date to arrange to pick-up the vests and bags, as well as to schedule for the garbage to be picked up. The Foreman should inform a group if chemical weed spraying has occurred within two weeks prior to the scheduled litter pick-up date for their assigned area.

The litter bags are collected and disposed of properly by the Contractor. (This is covered under the Maintenance Contract.)

The ***Annual Highway Clean-Up*** is a public service program sponsored by AT. It is open to all non-profit organizations. Junior Forest Wardens and 4-H Clubs have first priority to reserve their highway sections. Any unclaimed areas are then made available to other clubs at a later date. The clean-up takes place on the first Saturday in May, unless it is delayed by poor weather. In the event of poor weather the highway clean-up will be scheduled for the following weekend. If the clean up can not take place on the following weekend, then it is cancelled.

AT pays the groups on a per kilometre basis at the rates shown below (as of May 2010).

"A" Rate (Urban Rate) - $100.00/km of highway right-of-way cleaned on both sides. This rate shall apply to all roadways within 16 kms of an urban centre that has a population over 5,000 people.

"B" Rate (Special Area Rate) - $100.00/km of highway right-of-way cleaned on both sides. The Department shall identify all Special Area roadways prior to cleanup registration day. The Minister's representative, may at their discretion, deem a roadway to be a Special Area roadway due to an unusually highway concentration of garbage.

"C" Rate (Rural Rate) - $55.00/km of highway right-of-way, cleaned on both sides, on all other roadways.

In all cases, AT supplies the vests and garbage bags, and arranges the collection of the full bags. Participants sign up by contacting the district coordinator. Each group is required to complete a "Highway Clean Up Agreement". The group needs to contact the Department or Contractor's local contact one week before the clean-up date to pick up bags and vests. The Contractor invoices AT for Extra Work required for the Annual Highway Clean Up. The invoice is paid by a separate job number, to which items such as the rental of garbage dumpsters may be charged.

NOTE:

- Youth must be at least nine years old to participate in the Caring for Alberta's Highways Program or the Annual Highway Clean-Up.
- Youths between nine and 16 must pick up litter at the bottom of the ditch or on the back slope. They cannot be close to the road and they must be supervised closely by an adult.
- Volunteers in these programs may not clean medians on divided highways.
- All participating members in either program should be aware of the training requirements. These requirements can be found in the *Alberta Highway Clean-Up Training Manual*. Ensuring the highway clean-up is completed safely is the primary objective of the Department.

Caution: To distinguish areas that have recently been sprayed with herbicide, a blue/green dye that lasts a few days is now added to the chemical. Litter clean-up is not recommended while the dye can be seen. Maintenance Contract Inspectors work with the contractor to ensure spraying isn't performed for a minimum of 2 weeks prior to the Annual Highway Clean-Up. If area must be sprayed within the 2-week window, the MCI may wish to consider removing this area from the Annual Highway Clean-Up program.

http://www.transportation.alberta.ca/605.htm

2.1 ENVIRONMENTAL REQUIREMENTS

2.1.1 GENERAL

The Contractor needs to be aware of and follow all current environmental legislation and Federal, Provincial, and local by-laws and other legislation that could affect the maintenance operations, especially Department of Fisheries and Oceans, Transport Canada Navigable Waters, and Alberta Environment regulations for working near water bodies.

The Contractor is responsible for cleaning up any inert solid waste from asphalt concrete pavement (ACP), Portland cement concrete (PCC), soil cement, or any other waste created as the Work occurred. Any Work by-product that could be deemed as possible pollution must be cleaned up.

2.1.2 ENVIRONMENTAL MANAGEMENT PLANS (EMP)

As part of the Contract, maintenance yards must be designed and operated according to the document entitled *Environmental Management Plan Guidelines for Highway Maintenance Yards.* The follow up document, *Highway Maintenance Yards Task Group Report* must also be followed (see Appendix 6 for both of these documents).

An Environmental Management Plan (EMP) is an environmentally responsible plan for the design and operation of a highway maintenance yard. The EMP details are outlined in the two above mentioned documents. The aspects of the document preparation and administration are as follows.

- The Contractor prepares one EMP per highway maintenance yard
    - The Department provides a consultant to work with the Contractors to ensure the EMPs meet the requirements
    - The EMP Inspection Review Checklist is included as an appendix to the *Highway Maintenance Yards Task Group Report* document
- The Contractor executes the EMP
- The Contractor monitors and reports; the Department monitors
    - ***Contractor Reporting Responsibilities***
        - Semi-Annual Inspections (to demonstrate compliance with the EMP)
            - Done in January/February and July/August
        - Initial Groundwater Quality Sampling (to set the base line for the site)
        - Semi-Annual Groundwater Quality Sampling
            - Done twice per year
            - Test for sodium, chloride, calcium, magnesium, sodium adsorption ratio (SAR)
        - Monthly Quality Control Inspections (performed by Foreman, see *Highway Maintenance Yards Task Group Report* for form)

- ***AT's Consultant's Responsibilities***
  - Annual Spot Audit Inspections (winter)
    - EMP Bi-Annual Site Inspection (A checklist is included as an appendix to the *Highway Maintenance Yards Task Group Report* document)
  - Quality Assurance on Contractor's Monthly Quality Control Inspections (50% of sites per year)
  - Additional Quality Assurance Inspections as requested by AT (if AT becomes aware of significant environmental issues at a highway maintenance yard)
- The Contractor ensures proper product storage and handling
- The Contractor ensures proper spill prevention and response requirements are in place
- The Contractor safely operates the yard's Contamination Risk Areas
  - Designated Area
  - Sanitary Sewage Systems
  - Fuel and Oil Storage and Use Areas
  - Treated Lumber Storage Area
- The Contractor ensures proper salt storage and handling areas and in place
- The Contractor ensures proper saline water containment and storage

Contamination Responsibilities

- Sites now owned by Contractors that were previously government owned
  - AT is responsible for existing off-site contamination
  - Contractor responsible for on-site contamination and new off-site contamination
- Sites owned by Contractors, that were never owned by the government
  - Contractor is responsible for all on-site and off-site contamination

2.1.3 MAINTENANCE CONTRACT INSPECTOR'S ENVIRONMENTAL RESPONSIBILITIES

The Maintenance Contract Inspector must observe and monitor environmental concerns throughout the assigned maintenance area. Weed spraying, as well as spills of oil or other material on roads or rights-of-way are items that could raise concerns.

When there is a potentially hazardous spill caused by a motor vehicle accident, the MCI must consider his own safety, as well as public and Contractor safety before any other responsibility.

The MCI should spot-check the Contractor's vehicles that are carrying dangerous goods for appropriate paperwork and placards.

The MCI should have Transportation of Dangerous Goods training and access to *The Emergency Response Guidebook* (posted on Transport Canada's website at: http://www.tc.gc.ca/canutec/en/GUIDE/guide.htm), which gives information on the product such as:

- potential hazards

- product codes, so that the MCI can match the number on the TDG placard with the name of the product
- public safety
- emergency response requirements

NOTE: If a hazardous material is released and the MCI knows about it, then he is to call AT's Co-ordination and Information Centre (CIC) to report it (1-800-272-9600); CIC is staffed 24 hours a day, 7 days a week. The MCI will also call the Operations Manager. The CIC operator will notify all other agencies responsible.

2.1.4 SALT STORAGE

The impact of salt on the environment is a growing concern. Alberta Transportation and Contractor operations are being scrutinized to ensure that salt is used effectively and contamination is prevented, reduced, or eliminated. Refer to *Environmental Management Plan Guidelines for Highway Maintenance Yards* and *Highway Maintenance Yards Task Group Report* documents for the storage, handling, and application of ice control materials (Appendix 6).

One source of contamination can occur from poor housekeeping around the salt and sand sheds. Spills that occur at these locations should be cleaned up immediately, using shovels and brooms, and the loader if applicable. Doors to the salt and sand sheds need to be kept closed unless material is being delivered or removed. The intention is to minimize the potential for salt dust to drift off-site or water to leach it off-site. Keeping the door closed ensures that the salt remains in the shed, away from wind, snow, and rain. The Contractor shall ensure that the salt is protected from the weather at all times.

Loading of salt into the storage structure shall be performed using a conveyor or blowpipe system. The use of front-end loaders and push-type vehicles to move the salt into the shed is not preferred.

If salty water from the stockpile is caught in a holding pond, the pond must be able to contain the amount of water from the next normal storm. It should be pumped down to ensure that this level can be maintained. The MCI should work with the Contractor to monitor the pond levels. Salt water should be disposed of in a manner acceptable to the Department and Alberta Environment.

The Maintenance Contract Inspector should monitor the Contractor's activities to ensure that they are following the Environmental Management Plan (EMP) for the facility. In all maintenance facilities or sites, the Contractor shall conduct all activities in compliance with the Environmental Protection Act. www.ec.gc.ca/CEPARegistry/the_act

All Maintenance Contracts require a mandatory Environmental Management Plan for all maintenance yards.

2.1.5 WEED SPRAYING

Before setting the annual budget, the Maintenance Contract Inspector needs to meet with the Contractor and all the agricultural fieldmen in his Contract Maintenance Area to:

- discuss the previous year's weed spraying
- estimate the amount of chemicals needed and where they need to be applied for the upcoming season
  - it is important to select the most cost effective chemicals to treat problem areas
- determine who will be providing the service, Contractor or municipality, and the costs associated with each

Once the budget plans have been made, the MCI needs to meet with the Maintenance Contractor, the Foreman, and any Subcontractor who would be involved in the weed spraying. At this meeting, they would clarify the planned locations and quantities required for the current years weed spraying program.

Often, the agricultural fieldmen will also be able to suggest what types of chemicals would be most effective for certain types of applications.

Implemented in 1998, the weed spraying chemical must include a visible dye to help identify areas that have been sprayed.

The MCI should stay in contact with the local agricultural fieldman when weed spraying is being done in case there are any other small areas that require spraying. The MCI should notify the local fieldman of any new weeds or areas to be sprayed that he notices during his travels through the area.

Alberta Transportation staff needs to perform the following tasks:

- inspect the Work for degree of kill and for warranty purposes
- mark the Work if necessary
- review that the Work has been reported accurately

The MCI should work with the agricultural fieldman to understand any "weed notices" that may be issued (letter from the municipality to Alberta Transportation notifying the Department of certain weeds in the provincial highway right-of-way). They should discuss the actual problem, area of concern, and method proposed to address the problem before the MCI issues a Work Order. Good communication, an early Work Plan, and keeping the agricultural fieldman involved can prevent most "weed notices".

The Contractor should ensure that the MCI knows where the Subcontractor is spraying, so that he can answer questions from the public, farmers, and others. The Contractor also needs to supply the following for all areas worked under AT direction:

- accurate records of application rates
- locations
- chemicals used

Landowners may request that the right-of-way in front of their property not be sprayed. The Landowner must fill in a *Right of Way Vegetation Control Application (Chemical Spray Exemption)* annually for this request. Refer to Appendix 5. Once filled out, the Landowner agrees to control the weeds in front of his property. If the weeds are not controlled by the Landowner, AT reserves the right to use chemicals to treat the weeds. A copy of the agreement must be sent to the Maintenance Contractor. "No Spray" signs are to be installed and maintained by the Contractor for the applicable season.

The Contractor must apply for special use approvals from Alberta Environment and/or the Department of Fisheries and Oceans for areas to be sprayed within 30 metres of any body of water.

Spraying for Grasshoppers: During dry seasons, the Department may receive requests to spray for grasshoppers. The Department will not spray for grasshoppers but may permit the adjacent landowner to spray the right-of-way, provided a completed "Provincial Highway Access and Work Agreement for Grasshopper Control Program" form is forwarded to and accepted by, the district office. The form is located in Appendix 5.

2.1.6 EROSION

The highway right-of-way is under the legal jurisdiction of Alberta Transportation. The Department is therefore responsible for controlling erosion from runoff and/or flooding within its limits.

Design Guidelines for Erosion & Sediment Control for Highways, published by Technical Standards Branch, in May 2003, gives details on erosion & sediment control. In addition a field guide has been developed for *Erosion Control for Highways*. These documents are available on the department web site.
http://transportation.alberta.ca/1812.htm

Erosion control is not part of the normal maintenance routine, and if done by the Maintenance Contractor, the Work would probably be negotiated as Extra Work. Or this Work may be tendered separately outside of the Maintenance Contract.

Rule of Thumb: Any erosion deeper than 300 mm (about one foot) needs to be repaired. The Maintenance Contract Inspector needs to check with the Operations Manager; Technical Standards Branch, Surfacing, Engineering, and Aggregate; or other MCIs to find out which methods of repair have worked best under local conditions and whether the project has sufficient priority and funding to carry out the required repair.

NOTE: There is a requirement under government regulations to exercise due diligence if the Work is being carried out near a watercourse. Review any planned Work with the OM before starting.

2.1.7 WORKING AROUND WATER BODIES

Special attention must be paid to maintenance activities around water bodies. Such activities include bridge cleaning, minor bridge maintenance, culvert cleaning, and beaver dam removal. These activities may introduce materials into the water that may adversely affect resident fish species or the habitat that supports them. By adopting good management practices and incorporating appropriate mitigation measures into the Work, potential adverse effects of fish and fish habitat can be alleviated or eliminated. See Alberta Transportation's *Fish Habitat Manual* http://transportation.alberta.ca/2644.htm and *Environmental Management System (EMS) Manual (v.5*) http://transportation.alberta.ca/2643.htm

The Fisheries Act

The Fisheries Act is Federal legislation established to manage and protect Canada's fisheries resources. As Federal legislation, the Fisheries Act is binding on Provincial and Municipal governments. Sections 35 and 36 of the Fisheries Act that apply to maintenance activities around fish bearing water bodies are outlined below.

Section 35 (1) is a general prohibition of any Work or undertaking that results in the harmful alteration, disruption, or destruction (HADD) of fish habitat.

Section 36 (3) prohibits the deposit of deleterious substances except in accordance to regulations or as authorized by Cabinet Order (Order in Council).

It is important to note in Section 36 (3) that it is the substance itself that makes the substance deleterious, and not the amount.

The entire Fisheries Act can be found at
https://www.ec.gc.ca/

SECTION 3
HIGHWAY MAINTENANCE – CONTRACT ADMINISTRATION

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3.0 BUDGETING

3.0.1 GENERAL

The essence of the budgeting process is the ability to allocate the appropriate funding to each of the 40-plus activities that are carried out under the Maintenance Contracts. This section will outline the process, but will not include the preparation of non-contract or administrative budgets.

The Provincial funding allocation for provincial highway maintenance is determined by the Budget Allocation Task Group (BATG), a subcommittee of the Operations Process Management Group (OPMC).

The Operations Manager and/or the Operations Engineer and/or the Operations Services Coordinator is responsible for preparing the budget inventory for each district in the summer before the new fiscal year (April 1) starts. Preliminary budgets are usually known in September, and the final budget for the next fiscal year is usually known in October or November. The Work Planning process should begin as early as possible. Contractors would like to know the quantities for the major activities before the end of September, to the extent that this is possible. Information on the critical activities (i.e., patching, line painting, regravelling, crack sealing, sand supply & stockpiling, mowing) is especially important. The other activities (i.e., asphalt surface treatment, spray patch, etc.) may also be important to Work Planning if there are significant quantities of Work planned for the upcoming fiscal year. The budget for all activities should fit within the funding allocation provided for each Contract Maintenance Area. As part of this process, Alberta Transportation has to meet the minimum dollar value, or quantity of Work, set out in the individual contracts.

Breaking the budgeting process into steps makes the task much easier to tackle. Winter and summer activities are funded from winter (Q###W) and summer (Q###A) job numbers, respectively.

a) From the winter and summer job numbers, commit the fixed cost activities for both winter and summer Work, based on the contract bid prices.

Fixed Costs

- 1100 Truck & Operator Availabilities and Heated Storage
- 3000 Highway Maintenance Work
- 4400 Indirect Operating Costs

b) From the winter job number allocation, set aside the funding for the core winter activities (variable) of plowing, sanding, and salting. The quantities for snowplow hours, sanding, and salting may be based on any of the following:

- a five-year average
- a rolling three-year average
- a best guess, based on currently remaining stockpiles versus projected needs

Plow hour and salt footprints are based on a 3+ year average (depending on the number of years of accurate and representative data). Each year, data is added to develop more accurate averages. Some adjustments are required as the highway network changes.

For example, in one year, (for budgetary purposes), only 90% of the snowplow hours and salt are funded, while 100% of the sand quantity is funded. As the winter progresses, the winter money may be reallocated to another part of the Province, if winter hits harder at one location than another. Winter money is separate from summer money.

Any unused budget in these winter activities during the year must be returned to the Department.

NOTE: Although some of the activities listed below are flagged as budgetary guidelines in this manual, these may change from year to year. The activity number may vary depending upon the Contract Specifications that apply for the Contract.

Winter Activities (Variable)

1100 Snow Removal And Ice Control: Snowplow Hours, Loader & Truck Hours
1200 Snow Removal And Ice Control: Grader Hours
1300 Snow Fencing
1400 Ice Control Materials

Summer Activities (Variable)

1500 Subgrade Excavation, Non-Paved Surfaces
1600 Crack Sealing *(Guidelines)*
1700 Apply Surface Seals
1800 Pot Hole Patching
1900 Surface Patching
2000 Asphalt Surface Treatment
2100 Deep Patch
2200 Roadway and Raised Median Cleaning *(Guidelines)*
2300 Line Painting *(Guidelines)*
2400 Pavement Markings *(Guidelines)*
2500 Grading Gravel Surfaces *(Guidelines)*
2600 Regravelling *(Guidelines)*
2700 Dust Abatement *(Guidelines)*
2800 Maintenance of Livestock Guards
2900 Provide Traffic Control
3000 Inspections: Additional Inspections
3100 Milled Rumble Strips
3200 Mowing *(Guidelines)*
3300 Chemical Vegetation Control *(Guidelines)*
3400 Culvert Maintenance
3500 Culvert Installation/Rehab/Replacement
3600 Maintaining Signs *(Guidelines)*
3700 Maintaining Traffic Signals/Lighting

3800 Maintaining Guideposts
3900 Maintaining Guardrail *(Guidelines)*
4000 Line Fence
4100 Bridge Maintenance/Rehab/Repair *(Guidelines)*
4200 Beaver Control
4300 Highway Cleanup
4400 Miscellaneous
4500 Ferry Operations
4600 AENV (Alberta Environment) Headworks Canals
5300 Ditch Maintenance
5500 Parks Road Maintenance (Alberta Tourism, Parks, and Recreation)

Critical activities from a Provincial level of service and Work Planning perspective include patching, line painting, regravelling, crack sealing, sand & salt supply & stockpiling and mowing. Other activities may be important from a Work Planning perspective, depending on the proposed quantity of Work for the upcoming fiscal year.

Budget Guideline Driven Activities

A number of activities have budget guidelines associated with them. These budget guidelines are considered as "Standards and Constants" that the Department uses for various classifications of roads. This means funds have been proportionally allocated among the Districts to ensure that a consistent level of service is provided to users on similar classes of highways, regardless of their location. Factors such as traffic volumes are used to help set the budget guideline numbers and prioritize Work. The aim is to make the boundaries between Districts transparent to the travelling public.

Budgeting for guidelines is relatively straightforward because the quantities for these activities are based on accurate inventories (e.g., line painting).

- The Field Support Technologist/Maintenance Contract Inspector/OSC/OE needs to ensure that the inventories are as accurate as possible. Much of this information is now available from TIMS (through AIA – Appurtenance Inventory Application) and data is being updated on an ongoing basis.
- The MCI/OSC/OE/OM will determine which portion of the inventory requires Work and is of sufficient priority for it to be included in the Work plan for a given year.

Occasionally, items which are normally budget guideline driven may have quantities deleted in that budgetary area for a specific reason. For example, an area might not require line painting or crack sealing because there is upcoming construction at that location.

If the guidelines have significantly changed from one year to the next, i.e., painting all 3 lines instead of 2, the Contractor should be informed in the preceding year (or as early as possible) to allow for coordination of sufficient resources to carry out the Work.

Reactionary activities

Any summer activities that are not budget guideline driven are budgeted at the discretion of the OM. This reactionary Work includes, but is not limited to, pot hole repairs, pavement patching, culvert repairs, accident repairs, and clean-up. These activities are more unpredictable than the others and therefore are difficult to quantify for budgeting purposes. Reasonable estimates may be developed based on past expenditure history, budget allocations, and anticipated inflationary factors.

Contractor inspections and/or AT surface condition rating (SCR) can identify areas requiring attention. Work is prioritized according to need and budget allocations, and programmed for the following year.

If the programmed Work varies significantly (i.e., more than 120% of the provisional quantities, for significant values of Work) the Operations Manager and Contract Manager may need to discuss issues such as dates of completion for the additional Work and additional resources required. There may also be some consideration given to price adjustments (up or down) for these additional quantities.

The MCI and the appropriate Contractor's representative (Superintendent, Foreman, etc.) should identify other Work to be carried out if additional funding becomes available during the season. A good estimate of the scope and cost of the Work should be determined ahead of time. If the Work is prioritized for later delivery, it can then be carried out with a minimum of additional administration. Early confirmation of the Work remains important to ensure that the Contractor can obtain the resources to complete it, because it becomes more difficult to obtain resources as the summer progresses; and the Contractor needs to consider pre-winter preparation.

Budget Monitoring and Forecasting

The Department is committed to using strong fiscal management principles and accurate fiscal forecasting practices. Each forecast must be the very best estimate of the costs that will be incurred in that fiscal year. A good forecast considers the costs of Work that is completed and accepted, completed but not yet accepted, issued but not completed, and programmed Work that is not yet issued. Considerations should be given to factors such as weather and the available resources to complete the Work at any given time. Contractors are good sources of information for forecasting as they will have information on the progress of the programmed Work, and the availability of resources to complete any outstanding Work.

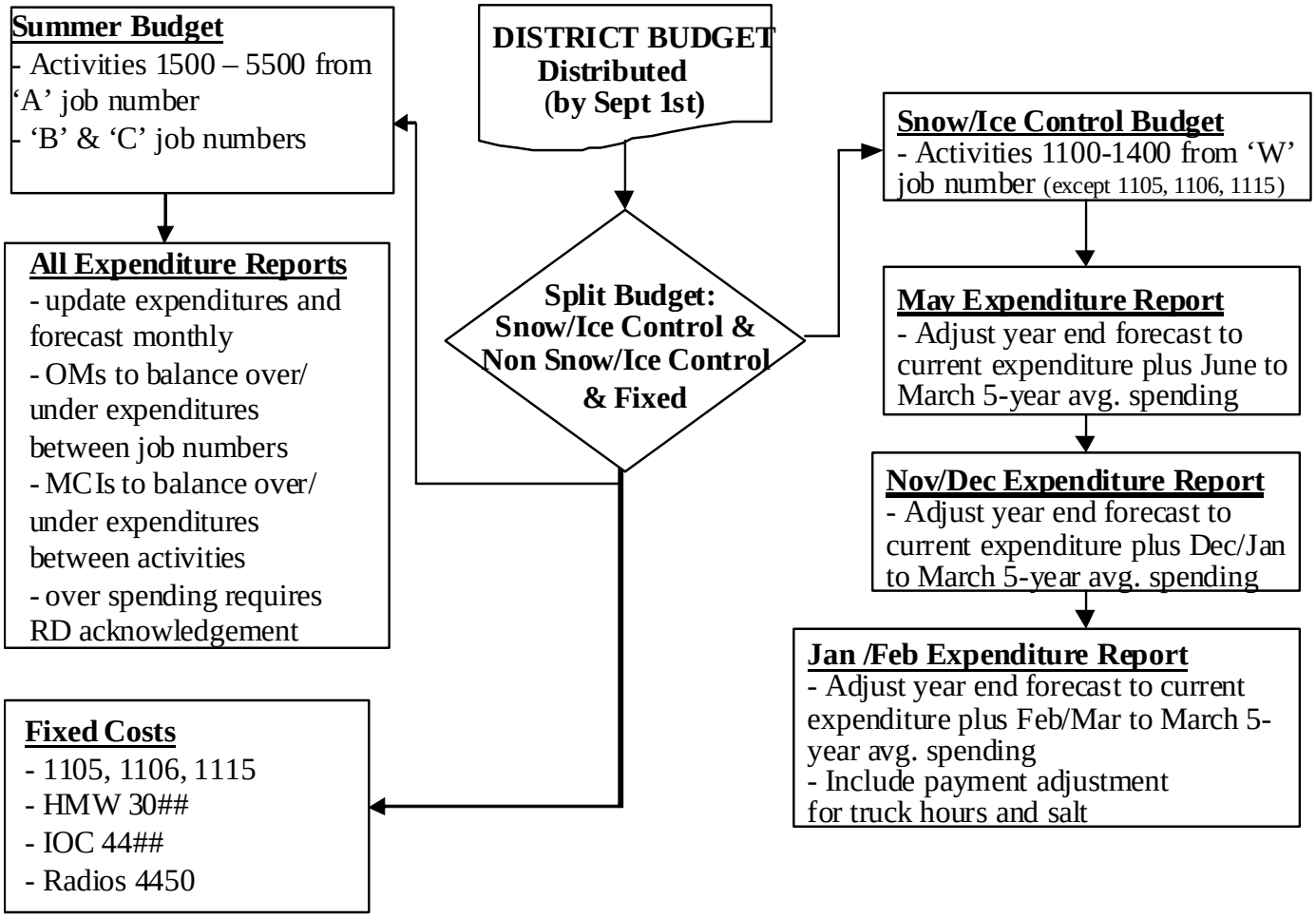
It is important to note that a forecast is not:

- Budgeting (a budget is an allocation of funds for the fiscal year. Forecasts are a prediction of the cost to complete the Work)
- Doing additional unplanned Work or cutting corners on projects to meet the project "budget"
- An inclusion of contingencies (but it does include all likely expenditures, which become known with greater certainty as the season progresses.)
- An inclusion of adjustments (bonuses, penalties) that will not occur (but it does include bonuses that will probably occur)

Forecasts (recorded in PMA) must be updated in CPMS (Contract Program Management System) within 5 working days of the end of the month. Each month, the forecasts for every active job number are rolled up provincially. Periodically the program forecasts are reviewed with Executive Management and decisions are made to release additional funds to undertake more Work or to scale back Work that had been previously identified and planned for.

The Department is responsible to ensure that the available funding is used to maximize value to achieve the desired level of service for the highway network. Budget allocations are compared with actual spending and allocations between Districts and/or CMAs are adjusted if necessary to meet provincial priorities.

Each OM is responsible for providing accurate forecasts for his District's job numbers. For the Highway Maintenance Program, all OMs have agreed to follow the process outlined below for budget forecasting. Budget and forecast information should be tracked in PMA and can be viewed in the *Month by Month Expenditures* and *Budget Allocation* Reports.



Also see Appendix 7 for a power point presentation outlining the budget and forecast process using PMA.

3.0.2 BUDGET ALLOCATION TASK GROUP (BATG)

Overview

The Budget Allocation Task Group (BATG) was formed in the fall of 1997. The group is chaired by a member of the OPMC who is responsible for providing recommendations on budgetary issues to the other members of the OPMC. Operations Engineers and Operations Services Coordinators make up the balance of the group. The group's task is to define and execute a fair process for allocating the Provincial highway maintenance budget along with other minor programs.

The process that the BATG uses to allocate the maintenance funding is based on a number of fundamental principles and assumptions:

- A Contract Maintenance Area (CMA) is the smallest entity that can be effectively budgeted for, allowing roll-up to Districts, Regions, and the Province.
- A total budget for the Province will be allocated and must be distributed proportionately among the CMAs.
- The process is intended to provide allocations that will meet the needs of the physical infrastructure (i.e., the funding should equal the cost of Work required for a given year). However there are uncertainties in defining the Work requirements because:
  - Budget guidelines may vary according to need and available provincial budget. Funding is allocated to balance the level of service based on minimum and optimum levels of Work versus the provincial budget allocation. Standards and constants are set to achieve the desired level of service for a given budget allocation.
  - Maintenance, by its nature, will always contain an unpredictable, reactive component as the network infrastructure ages, is damaged, or suffers the effects of the environment to greater or lesser degrees.
- The Operations Managers administer the Work on an annual basis. If all the identified Work cannot be done within the funding limits, then some of the Work must be deferred until the following fiscal year(s). The Work is prioritized and as much of it is done as funding allows.
- The extent and condition of the infrastructure and associated traffic volumes are integral factors in determining the amount of Work needed.
- The allocation will be sensitive to differences in unit prices among all the Maintenance Contracts. This allocation will also be affected by the yearly inflation factor.
- Pavement rehabilitation will influence maintenance funding. A rehab project will reduce certain activities for the fiscal year it is undertaken and for several years following.
- Special funding may be made available for major initiatives such as major sign replacement, geotechnical projects, larger rehabilitation projects, and gravel purchases.
  - To illustrate the value of making larger material purchases, sometimes buying a multi-year supply of manufactured aggregate (sand or gravel) can mean obtaining a lower unit price and lower mobilization costs.

Process

The allocations are determined using a five-step process in two primary areas; contract and non-contract. The following costs are allocated and distributed from the total budget for each CMA:

Non-Contract Costs

1. all non-contract costs such as utilities and administration

Contract Costs

1. all contract fixed costs
2. all contract snow and ice control costs
3. all contract budget guideline driven costs necessary to maintain level of service
4. the remaining provincial maintenance funding is allocated as *reactionary* funds to the maintenance areas

Budgetary Guidelines

BATG considers it is important to use budgetary guidelines called Standards and Constants for the allocation process because:

- the road users and maintenance Contractors have a right to expect that roads with similar traffic volumes will be maintained to a similar standard, regardless of location in the Province
- budgetary guidelines support the development of performance-based contracts
- budgetary guidelines help determine resource allocation
- budgetary guidelines help dictate some of the general objectives and associated content of Work Orders
- budgetary guidelines ensure that remote or lower-traffic-volume highways are maintained to an adequate and consistent standard.

The BATG looked at every maintenance activity to determine if a budget guideline already existed or could be set to meet the annual Work requirements on the road surface or associated appurtenances such as signs, guardrails, etc.

The group gathered information on road preservation, public expectations, appurtenance replacement, and pavement rehabilitation scheduling from Operations Managers, Operations Engineers, Operations Services Coordinators, and Maintenance Contract Inspectors. Two sets of guidelines emerged: ***minimum*** and ***optimum***. Funding determines if the maintenance budget is allocated at minimum, optimum, or somewhere in between. In general, minimum budget guidelines are to provide a budget level that sustains the network, but does not significantly improve the overall network level of service or significantly impact maintenance shortfalls. Optimum maintenance does consider improving the network to achieve life-cycle maintenance targets and addresses shortfalls in network maintenance efforts.

Reactionary Work

Reactionary funds (funds remaining after all other costs are allocated) are typically anywhere between 5% and 7% of the total budget. These numbers can be revised to account for available funding as other activities are covered and allocated under budgetary guidelines.

The reactionary funds are distributed among the CMAs, using a formula that considers two lane equivalent kilometres of highway.

The reactionary funding must pay for everything not already allocated. It includes activities such as:

- additional patching
- culvert cleaning, repair, and replacement
- traffic control
- beaver control
- brush control
- delineator replacement
- accident damage repair (e.g., signs, guardrail, etc.)
- minor bridge repair, wooden strip deck repair
- livestock guards
- fence repair
- minor erosion damage repair
- debris removal
- unscheduled patrols

3.0.3 REVIEW BUDGET QUANTITIES WITH MAINTENANCE CONTRACT INSPECTOR & FIELD SUPPORT TECHNOLOGIST

The roles of the MCI and FST in preparing the budget are:

- to assist in maintaining an accurate inventory of the infrastructure; much of which is stored in AIA (appurtenances) and TIMS (network)
- to prepare accurate estimates of the Work quantities required for the upcoming season (e.g., crack sealing, pavement patching, line painting)

The inventory is used by the BATG to determine the level of funding for budgetary guideline driven Work. The estimates are used to allocate the funds once they are approved by the BATG.

The MCI should keep in mind that the budget allocation is primarily a guideline and should be fine-tuned as the fiscal year progresses. For example, savings in an early summer activity such as sweeping may be transferred to a later summer activity such as brushing or mowing, although some consideration needs to be given for restrictions on Contractor resource availability later in the season and for Provincial directives. The budget reallocation also helps the Contractor complete their Work Plan so they can obtain and reallocate their resources for undertaking the Work. It is recommended that the MCI be aware of activity spending in the District as funding may be available from other District CMAs. Alternatively, expenditure shortfalls in one CMA may be distributed to other CMA to complete necessary Work. The OE/OSC or OM would coordinate this redistribution within a CMA.

3.0.4 REVIEW WITH MAINTENANCE CONTRACTOR

Alberta Transportation should include the individual Contractors in the budgetary process well before the fiscal year starts, which ideally is as early as September of the previous fiscal year.

AT and the local maintenance contractor staff are to share information on areas of roadway or rights-of-way that need repairs or special attention.

When the Contractor's management team (Superintendent, Foreman, and/or others) are involved in the budget process, they will better understand the Department's overall objectives so they can develop a Work Plan that will maximize the likelihood of completing the desired quantities of Work ordered. Contractors should review the quantities and priorities being requested so they can stay within the budget and meet the overall timelines and Work expectations. The Contractor can also identify to the Department the impact significant increases to the provisional quantities may have on his ability to deliver a program. Additional resources may be required or different avenues of delivering the Work may need to be explored.

The MCI should communicate regularly with the Contractor to ensure that all areas and activities are receiving appropriate attention.

Once the budget is determined, the Contractor will be able to prepare a preliminary Work Plan to match the Work to the available resources (i.e., manpower, materials, and equipment), and obtain additional resources if required.

3.1 WORK PLANNING

See Appendix 8 for a document that outlines the Department's and Maintenance Contractor's joint effort in outlining the Work Planning process.

3.1.1 WORK PLANNING

Work Planning is the process of determining the quantity of Work required for a given activity, then determining the resources (manpower, equipment, materials, subcontractors, etc.) required to undertake it in the available timeframe. The Contractor uses the quantity information provided by the Department for the Work Plan. The Work Plan seeks to balance available resources, expected productivities, and activity priorities against the available and desired timeframes. The initial Work Plan is to be reviewed with Department forces to ensure that it meets the objectives of both parties. If there are issues with the Work Plan, it should be modified, working together to come up with a plan that achieves mutual objectives. The final version should be completed before the beginning of the fiscal year so all parties knows what the plan and tentative schedule is. Partnering is a critical aspect of Work Planning in that it recognizes that both parties have similar objectives, and a mutual understanding of the objectives allows and encourages each to assist each other in achieving their goals.

The Contractor will provide the Work Plan in a suitable format. Ideally, the Contractor will provide graphs that show the proposed progress of the Work as these are helpful aids to understand what the Contractor's intentions are, and for aiding the joint review of the Work Plan both initially, and as the Work progresses.

Once the Work Plan is developed, the Contractor is required to obtain the resources to complete the Work. If there are difficulties obtaining resources or delivering the Work within the agreed timeframe, the Contractor and Department will work together to resolved the difficulties. In some situations, the Department may be able to assist with resources; in other situations, not. If diligent efforts fail to obtain resources, the Contractor should work with the Department to develop alternatives for delivery of the activity, or to find alternative Work that will continue to achieve Department priorities.

3.1.2 ACTIVITY PLANNING

The Contractor will provide a Work Plan for the "major" activities. Major Work is activities that are of significant value, are plannable and are of significant concern to the Department for meeting their objectives, such as public safety and maintaining the efficient flow of goods and services. **Major/critical activities** are typically identified as

- line painting
- sand & salt supply
- surface patching
- regravelling
- crack sealing
- mowing

Other activities of sufficient value may be added to the Work Plan. While they may not necessarily be critical from an overall provincial perspective, they may be of significant impact to a local CMA or Contract. This should be worked out between the Contractor and the local AT representatives by mutual agreement. Examples of these activities are ones such as asphalt surface treatment, dust control, spray patching, pavement messages, chemical vegetation control, etc. This is especially true if the Work identified is of significant value or possibly if it varies considerably from previous years.

3.1.3 REACTIVE WORK/ROUTINE WORK

Reactive Work is not normally considered to be plannable. The extent of Work Planning is generally limited to estimating the quantity of Work based on historical quantities. An example of predictable reactive Work is traffic control. The quantities can vary from year to year, sometimes significantly, but the overall value is usually within a consistent range.

Routine Work, such as gravel road maintenance with a grader, is largely based on historical information, with some adjustment made for varying road conditions and weather.

3.1.4 WORK PLANNING FACTORS

As a general rule, Contractors factor in some degree of delays in the Work. One method to do this is to adjust the expected productivity to a lower level anticipated to account for things such as rain delays. Contractors may also have some contingencies so that they can do other Work if the primary scheduled activity is delayed. For instance, they could undertake bridge washing if crack sealing Work is rained out. However, even though there are some considerations given to delays, extreme events (like a flood) likely mean the Contractor may not complete a certain Work activity by the date he indicated on his Work Plan. In the event of these extreme events, the Contractor will likely wish to discuss the progress of the Work, and may ask for an extension if they believe it to be reasonable under the circumstances.

Contractors will also make their plans based on the availability of certain resources. In some cases, resources will not become available until a date other than originally scheduled. One example is asphalt supply. In some cases the asphalt plant only operates for a limited timeframe, based on the needs of its major purchaser or other projects. The Contractor needs to work around the supply issues, which may delay the Work, or dictate that it start early – based on the availability of the plant in the area. These situations are not in the Contractor's control, although they may have influence on them in some circumstances.

3.1.5 SURFACE CONDITIONS RATING (SCR), HIGHWAY INSPECTIONS, AND PAVEMENT REPAIR

Surface condition rating data can provide a significant amount of information to determine pavement repair requirements and the approximate costs of undertaking these repairs. However, these estimates could change drastically in a season, depending on the weather, traffic, and the deterioration of the road surface.

The contractually required inspections are also a significant source of information. When more detailed information is required to plan the main activity-planned Work (location, quantities, etc.), then it is appropriate to Work with the Contractor to obtain this information in a mutually agreeable format so the Contractor can use this information to obtain the required resources. For many activities, such as surface patching, it is worthwhile to look at the roads jointly to identify areas that require Work and to develop and prioritize the potential Work.

3.1.6 OPERATIONAL PLANNING MEETINGS AND WORK SCHEDULING

Work scheduling should be discussed regularly with the Contractor. Meetings should be held as early as possible after the new budget is rolled out to coordinate Work Planning, starting at the CMA level then to a larger scale, including the whole Contract area. These discussions also help to ensure that Work is ordered in a manner such that the Contractor can complete it on time and achieve the priorities and objectives of the Department. The Operations Meetings and/or local CMA meetings are forums for these discussions. Once the Work has commenced, Maintenance Contract Inspectors can plan their schedules to inspect whenever possible and provide ongoing feedback to the Contractor.

3.1.7 MAINTENANCE CONTRACTOR'S RESOURCES

Each Contractor has his own resources available to do the Work. Effective communication between the Maintenance Contract Inspector and the Contractor is necessary to optimize the utilization of the Contractor's equipment. Communication is also required if the Contractor needs to mobilize specialized equipment or hire it from others.

Efficient utilization of the Contractor's resources (manpower, equipment, and materials) is beneficial to both the Contractor and the Department, even to the point of maintaining or reducing some of the costs of the Work in the long term. Efficient operation for the Contractor typically allows for increased productivity, which in some cases may help to offset inflationary factors. Even if this does not provide a short term pricing difference, it will help the Contractor provide better pricing in future rebids or Extra Work prices. It also can be an important factor in improving or maintaining Work quality, for improving Contractor Work management, and to assist in improving Contractor employee morale and Work experience.

3.1.8 SUBCONTRACTORS

Subcontractors may Work for others, so it is important that scheduling and planning are kept up-to-date. Other commitments and obligations can complicate getting the Work done on time. Subcontractor coordination is the responsibility of the Contractor. Since programs may conflict, (i.e., crack sealing and line painting) very closely coordinated efforts are required by the Contractor. The Contractor is expected to keep the MCI up to date on the Work currently being carried out and with any changes to scheduling.

Early information and confirmation from the Department on the proposed Work is extremely valuable to the Contractor in terms of arranging for Subcontractors. If the Contractor is delayed in terms of confirming the Work to the Subcontractor, the Subcontractor could and very likely will find other Work. Even if there are a number of different potential subcontractors, when the industry is very busy overall, all of the Subcontractors in a given Work sector could become busy as well. It also becomes increasingly critical for late season Work, as the Subcontractors are trying to wrap up other projects, and the Contractor becomes absorbed with pre-winter preparation.

3.1.9 SEASONAL WORK

Most Work done under the Maintenance Contract can be broken down into seasons: summer and winter. The Department and the Contractor need to review both present and future Work activities, then develop the Work Plan for each season, and review it during the Operational Planning and/or CMA Meetings. Any on-going or future Work should be planned as early as possible and its status reviewed at Operational Planning and/or CMA Meetings.

For example, as early as possible prior to the winter season, even as early as the prior fiscal year, the Contractor should ensure that he has a salt supplier, a good sand source, adequate snow fencing supplies, and suitable equipment for the upcoming winter, to as great an extent as this can be accomplished. In the winter season, the Contractor should arrange for the supply of summer materials (such as crack sealant, line paint, etc.) and/or Subcontractors for Work that the Contractor intends to subcontract out (i.e., crack sealers, line painters, surface patches, etc.).

3.1.10 ADDITIONAL WORK PROGRAMS

AT should forward plans pertaining to the Contractor for corrective and preventative maintenance and other extra maintenance activities as soon as funding is known and programs are developed, so the Contractor can line up Subcontractors and necessary materials to complete these programs. Ideally, information would be available in the fall prior to the fiscal year in which the Work is scheduled to be undertaken. The MCIs should also have other projects “on the shelf” for rapid delivery if extra funding becomes available late in the summer season. Estimates could be received from the Contractor for delivery of this Work ahead of time, to be firmed up later if the projects are to go ahead. It should also be emphasized that early

identification and go ahead for the Work will increase the likelihood that Contractors can obtain the resources necessary to do the Work in the desired season.

3.1.11 WORK PLAN CHANGES

It is important to recognize that the Work Plan is an active document. It is a near certainty that the Work Plan will require changes through the course of the summer for any number of reasons. Weather issues, resource shortages (manpower, equipment, materials), changes to Department priorities, additional Work added during the course of the season, changes to scope of Work for some activities, balancing priorities amongst CMA's, other Subcontractor commitments, etc. may all cause issues or delays. In most cases, the Contractor will be able to deal with issues without significant input from the Department. In other cases, the Contractor will need to review the issues with the Department and determine whether there are other options available to achieve the desired objectives. In some cases, these factors may result in discussions about extensions to due dates which need to be reviewed based on their merits.

3.2 HIGHWAY MAINTENANCE WORK

3.2.1 ONGOING MAINTENANCE

Reference: Spec. 53.39 Highway Maintenance Work

Since this is one of the few non-quantity-based specifications, there may be differences between the Department's and the Contractor's understanding of highway maintenance Work. Department staff need to be clear on the intent of the specifications and Special Provisions and these expectations must also be realistic and consistent across the province, and clearly communicated to the Contractor.

Highway maintenance Work includes the performance of regularly scheduled and planned maintenance tasks such as highway inspections, emptying litter barrels/bins, washing signs and guideposts, straightening guideposts, replacing missing bolts on signs, etc. Highway maintenance Work also includes the performance of reactive Work, which includes urgent and priority emergency Work which could have an immediate impact on public safety (such as replacing fallen regulatory signs, particularly stop and yield signs). The Contractor is responsible for performing these tasks, as outlined in the Specification and in the Request for Proposal.

Routine maintenance Work not covered by specific bid items are paid for under this activity including some of the cost of the Contractor's manpower and light duty equipment to perform this Work and potentially some other costs not otherwise covered in other activities. These costs are paid as a monthly lump sum pay item which is a fixed cost payment. Additional Work may be performed in conjunction with Highway Maintenance Work and paid for separately.

The Contractor's employees need to understand that HMW – and not just bid item Work paid at a unit price – is part of the overall job to be done. To ensure that everyone understands their responsibilities on general highway maintenance Work, the following should happen:

- The ***Contractor's Superintendent and/or his Foreman*** should discuss the Work at regularly scheduled meetings to ensure Contractor employees are familiar with the Contract requirements for this Work. They also need to encourage their employees to keep up good highway maintenance Work practices on an ongoing basis.
- The ***Contractor's Superintendent and/or his Foreman*** should become familiar with the Contractor's Request for Proposal (RFP), Specification 53.39, and Special Provisions, which outlines the responsibilities of the Contractor.
- The ***Maintenance Contract Inspector*** should be available to attend meetings to review and discuss questions on the proposed HMW on a monthly basis. He should be conscious that his responsibility is only to clarify concerns from a Department perspective, not direct Work.

The MCI should discuss the Work that needs to be done with the Superintendent and/or area Foreman as applicable, either informally or at the Operations or CMA Meetings.

Highway maintenance Work is reported via a Crew Worksheet. There is a standard form called a *Highway Work Identification Form* that lists completed and required Work (see Appendix 9). It covers routine activities, observations, and safety-related items discussed in Specification 53.39 and its subsections.

3.3 WORK ORDERS

3.3.1 INTRODUCTION

One of the key tasks of a Maintenance Contract Inspector is issuing Work Orders. The Work to be performed under the terms of the Contract should be defined as specifically as possible by the activity and the bid item.

The Work is usually identified in one of the following ways:

a) Work is identified on the Highway Inspection Form by the Contractor and prioritized by the MCI.
b) Work is identified through a more detailed process to determine quantities and locations of Work by the Contractor and/or the Department. Preferably this process is undertaken together to gain a joint understanding of the Work.
c) The Department identifies and orders the Work.
d) The Contractor identifies Work and requests a Work Order, or they complete a Proposed Work Order in PMA
e) Third parties (i.e., public, politicians, etc.) may identify Work that needs to be done.
f) Work programs are forwarded from other government agencies (i.e., Environment, Parks) for management by the Department and delivery by the Contractor.

3.3.2 FACTORS TO BE CONSIDERED BEFORE ISSUING A WORK ORDER

Some factors that need to be considered by the Maintenance Contract Inspector before he issues the Work Order are:

a) how the Work ties into the agreed upon Work Plan
b) available CMA budget (remaining and forecasted)
c) size and scope of the Work. It may be more appropriate to tender large projects or to bundle small projects
d) the Contractor's ability to obtain resources (manpower, materials, equipment, and/or Subcontractors) necessary to do the Work
e) Work priorities and a reasonable balance of completion dates so that it is possible for the Contractor to complete the Work on time. (Generally this has already been decided in the District's Work Plan.) MCIs cannot extend Work Order due dates without the approval of the Operations Manager. The MCI may recommend to the OM to extend a Work Order due date.
f) Work priority and whether the Work is urgent and mobilization is expected in a short time frame
g) other factors, such as weather which will allow (or prevent) the Work to be performed in a given time frame

Good communication and sessions to review Work planning (like the Operations or CMA Meetings) need to be used to discuss scheduled, upcoming, newly identified, and desired non-urgent Work projects and their relative priority. The Department staff and the Contractor should

discuss the quantities and time limits needed for the job before the Work Order is issued, so both sides understand the logistics of getting the job done efficiently and can address any potential issues with the Work and make changes to the schedule.

Scheduling Issues

Scheduling and payment issues may be averted by dividing the Work Order into two or more different Work Orders. For example, when numerous signs are required, the MCI could issue one Work Order to get the signs manufactured and supplied, then a second to get the signs up. The MCI should seek the Contractor's input on reasonably sized Work Orders to ensure that the Work can be done within a reasonable and mutually agreeable time frame.

Work should be scheduled according to the agreed upon Work Planning document that was developed by the Contractor and the Department (see Appendix 8 for guidelines on Work Planning). Recognize, however, that this document is a "living" document and may change throughout the season.

Effort must be made to resolve any conflict(s) in a timely manner. Disagreements should be resolved in the manner agreed to by both parties in the Partnering Conflict Resolution Process. Poor working relationships create numerous difficulties for the parties involved in the Work Planning process and are likely to lead to undesirable outcomes for both parties.

Department personnel need to remember that each Contractor runs a private business that has to make a profit to survive. The Contractor's personnel must maintain awareness that the Department's major purposes are the safety of the travelling public and the preservation of the highway network for efficient movement of people, goods, and services. In addition to these objectives, the Department is tasked with managing public funds effectively and efficiently to achieve quality Work outcomes. The Contractor's job is to maintain the level of service as described in the Contract documents. Partnering considerations identify that the Department and the Contractor shall emphasize a mutual understanding of each other's objectives and seek to help each other achieve them.

Methods of Calculating Quantities and Necessary Materials

There are several methods of calculating quantities of materials that will be necessary for a specific project:

- information gathered from the highway inspections
- information gathered from activity-specific road tours to collect detailed Work specific locations and measurements. (Joint measurements are often a preferable method of accomplishing this.)
- compiling technical data, such as surface condition rating, etc.
- gathering historic data such as that obtained from previous Work Orders and/or actual quantities of Work completed

using mutually-agreed-upon methods, such as those derived from measurements taken at locations throughout the segment, using a specified process, and taking into account previously known inventory quantities where available, or good engineering judgment.

3.3.3 GUIDELINES FOR ISSUING WORK ORDERS

See Appendix 10 for a Guide on Consistently Issuing Work Orders

Generally, Work should be ordered as per the Work Planning document submitted by the Contractor and agreed to by the Department.

Once the Work has been identified, it is prioritized, based on public safety, desired Work outcomes, available budget, and interactions with other Departmental Work and programs.

Communication for the Work to be done should be in writing. Verbal communication is appropriate for the initial discussion with the Contractor about issuing the Work Order, and may be used in some circumstances to define the Work, but it increases risk of misunderstandings and errors in completing the Work. The communication needs to include:

- estimated or pre-determined quantities (additional detail may need to be provided on spreadsheets or other methods of summarizing the Work)
- where the Work is to be done (details on the Work Order or by using supporting documents as required)
- what type of Work activity is best suited to the task
- when the Work has to be completed (specified completion deadline)
- pre-existing conditions that may have warranty implications
- any special requirements (i.e., extra traffic accommodation, special equipment, special materials, etc.)

In certain circumstances, the Contractor may undertake the Work prior to receiving the Work Order. These circumstances need to be reviewed between the Department and the Contractor and parameters set regarding the limited occasions when this is appropriate. It is generally expected that the Contractor will communicate that this Work has been undertaken, preferably verbally, and then followed up by an interim form of documentation (written note or e-mail are examples). The Contractor would then put in a Proposed Work Order for the MCI to issue a Work Order.

The Work Order is then generated in PMA and can be viewed by the Contractor.

Once the Contractor has the Work Order, he has confirmation about the specifics for the Work. Any concerns regarding the Work Order should be addressed at this time, with emphasis placed on doing this before the Work starts. The Contractor will try to schedule the Work so that it is completed effectively when he has gathered the resources (manpower, equipment, materials, and/or Subcontractors) to meet the timelines established in the Work Planning document.

The completion date on the Work Order is very important, since the Department tracks late and overdue Work Orders. Contractor performance is partially evaluated on this basis. Each activity on the Work Order has a predetermined amount of time assigned to complete the Work (measured in number of working days). The number of days required cannot be shortened without agreement, but the terms could be extended if the necessary conditions exist. Any shortening or extension to Work Order due dates must be approved by the Operations Manager.

The Maintenance Contract Inspector may recommend to the OM that the Work Order be changed. Some Work has established and specific due **dates** as agreed to between the ARHCA and the Department (i.e., conventional crack sealing). These Work Orders may be ordered earlier in the season, so the Contractor has more time to complete the Work than that listed in the specifications, as long as the Work is completed by the agreed upon date.

Some Work Orders are issued as required on a monthly basis, such as fixed costs, snow and ice control (using AVLS Automated Billing), highway maintenance road inspections, or the use of a grader for snow removal. Others are issued as needed; for example for beaver control and culvert repair.

Work Orders can also be issued on a seasonal basis.

3.3.4 FINALIZATION OF WORK ORDERS

All Work and inspections completed (or in progress) by the Contractor will be reported in PMA on a regular basis and be available for the Maintenance Contract Inspector that issued the Work to review. The Crew Worksheets and Snow and Ice Worksheets contain the following information:

- batch number
- sheet number
- sheet status (submitted, accepted, returned, rejected)
- contract number
- contractor
- fiscal year
- work order number
- line items and their status (completed or not)
- job number
- MCI
- segment
- bid item/extra work number and description
- work date
- pay quantity
- unit of measurement (pay unit)
- reference sheet (attachments)

In addition, Snow and Ice Worksheets contain:

- start and stop times
- start and stop metre
- hours
- start and stop km
- sand and salt quantities (tonnes)
- prewet (litres)
- stock pile location

- operator
- unit number

The Maintenance Contract Inspector reviews the electronic Crew Worksheets in PMA. If they are OK, then the MCI approves the Crew Worksheet for payment. If errors are found, then the MCI returns the affected sheet and it is "sent back" to the Contractor for clarification or correction (made available to the Contractor in his realm of PMA, for review and change if applicable). After Crew Worksheets have been reviewed and accepted, the MCI produces a batch report (called an Accept/Return/Reject Report) and this is available to the Contractor. This report advises the Contractor as to what has been accepted and not accepted for payment so their financial officers know what their cash flow is, and so field forces can make corrections and resubmit the returned Crew Worksheets or address the rejected ones. The quicker the errors are identified, the quicker they are corrected.

Once AVLS generates the Snow and Ice Worksheets, and the foreman reviews and submits them, the MCI reviews the electronic Snow and Ice Worksheets in PMA. The MCI either accepts, returns (to AVLS where the foreman can make corrections), or rejects (cannot be changed and a new manual sheet must replace it, if appropriate) the sheet.

Work done by Subcontractors must be reported on Crew Worksheets in order for the Department to pay the Contractor for that Work.

The Contractor should identify any problems they encountered while performing the Work, for future reference. Problems should be reviewed at Operations and/or CMA Meetings or Work Planning/Scheduling meetings.

The Contractor is to submit appropriate documentation on the Work in progress. The OM will work with the Contractor and determine the form that the Contractor's invoice/documentation will take for Work in progress. The MCI is authorized to approve interim payment for Work in progress as long as it is supplied in the agreed format.

Once the tasks on the Work Order are complete, the Contractor must submit Work records to the MCI that certify that the Work has been performed and completed according to the terms of the Contract (Crew Worksheets, filled out and submitted to PMA). The earlier the CWSs are submitted to AT, the quicker any problems with quantities or measurements may be identified and resolved. All problems identified must be resolved as soon as possible to allow for a better cash flow to the contractor and more accurate forecasting by the Department.

3.3.5 WORK ORDERS IN EMERGENCY SITUATIONS

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

1. When the Contractor observes an emergency situation or is contacted directly by emergency services such as the RCMP, local fire Department, Disaster Services, or other similar agencies 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 notify the Maintenance Contract Inspector/Operations Engineer/Operations Manager of such requests as soon as possible, but shouldn't wait for a Work Order to proceed with the Work. If none of the specified Department representatives are immediately available to approve the response, the Contractor shall use their best judgment in responding to the incident in the earliest reasonable timeframe. The Contractor is expected to leave messages via voice mail, fax, e-mail, etc., as deemed most appropriate to make the Department aware of the situation as it occurs. After the emergency is responded to, a Work Order will be issued to the Contractor for compensation of Work done.

   Typical situations can be discussed in advance in Operations Meetings to ensure the response is handled in the most effective manner.

2. 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 MCI/OE/OM, as specified in the Contract, or as otherwise reasonable. After the emergency is responded to, a Work Order will be issued to the Contractor for compensation of Work done.

The Contractor shall treat the absence of, or damage to, critical traffic signs, in particular stop and yield signs, as an emergency situation and shall respond accordingly. Approval for undertaking this Work is deemed to be granted on an ongoing basis, although a Department representative should be notified as early as possible.

If there is a conflict between priorities, such as between Winter Snow and Ice Control versus Traffic Control for a collision or other developing winter maintenance issues, the Department and Contractor shall review the situation and prioritize the response, with the Department having ultimate authority in these circumstances. Depending on the severity of the winter storm and road conditions versus the severity of the collisions, it may be more appropriate to continue winter operations than perform traffic control. However, this should be discussed early in the development of the situation so it is clear to the Department, the Contractor, and relevant third parties (such as emergency response services or the R.C.M.P.).

A Work Order should **NEVER** be required before the Work starts in an emergency situation.

Joint review of the response and Work undertaken may be appropriate for some events to ensure Department and Contractor forces have the same understanding of the Work requirements when mobilizing a response. It is important that Department forces note that it is generally better to encourage a proactive response from the Contractor.

3.3.6 SPECIFIED COMPLETION DATES

The completion date is the date when the Contractor satisfactorily completes the Work to the Contract specifications or the terms as agreed upon for Extra Work. This date is to be used on the Crew Worksheet, and not the date of entry in PMA. The actual completion date is not the date that Alberta Transportation received the paperwork from the Contractor, but the date the Work was done. It is important for the Contractor to remember to mark Work Orders appropriately and submit paper work in a timely fashion, as reporting otherwise could cause issues with their performance measures. In some cases, corrections may need to be made in PMA, either by the Contractor submitting a new Crew Worksheet with the correct Completion Date, or by the MCI making corrections in PMA. The order of acceptance of the CWSs need to be monitored to ensure that the correct completion date is accepted into the system. If there are several Crew Worksheets or Snow and Ice Worksheets for one Work Order, the MCI is to review and accept the Sheets in chronological order (review the one with the earliest date first).

If the MCI has to mark the Work order "Complete", it defaults to the date he does this, and not the actual Work completion date. In this situation, the MCI has to physically change the completion date field to match the actual completion date.

3.3.7 WORK ORDER REVISIONS DUE TO CHANGES IN SCOPE

Work Orders should generally only be revised if minor items were initially left out, if minor changes in the scope (quantity and value) of the Work are required, or if an error has been made. Significant changes to the Work Order may require the first Work Order to be cancelled and a new one issued. Or an additional Work Order may be issued.

Rule of thumb: If the revisions increase the scope of the Work by more than 20 %, then it would be worthwhile to consider two Work Orders, especially if it is for Work of significant value – issue one for the original Work and the second for the additional Work. For example, it would be appropriate to issue 2 Work Orders if the quantity of patching increased from 2,000 tonnes to 4,000 tonnes. On the other hand, it isn't important to do this for smaller Work Orders, such as when the quantity of minor signs increases from 5 signs to 10 signs – a revision is acceptable. It isn't typically required to revise a Work Order if the quantities are reduced.

In the event there is a significant change to the Work Order, it is important to consider the impact to the overall budget and other CMAs in the Contract. Increasing the quantity of Work for an activity in one CMA may delay the timing when the Contractor can get to the next CMA.

3.3.8 EXTENSIONS OF WORK ORDER DUE DATES

Communication is a key component in getting the job done safely, effectively, on time, and to the appropriate standard. In the spirit of partnering, an extension to a due date may occasionally be appropriate, given sufficient extenuating circumstances. These circumstances typically being

outside of usual expectations for the Work or requests by the Department to do other Work outside of the Work Plan, which then results in a need for resource prioritization.

PMA automatically assigns default due dates on the Work Orders. These automatically assigned dates, however, can be extended, as required. Note that in PMA, when due dates are extended (or shortened), a comment is required.

If either Department staff or the Contractor think that the due date might need to be changed, then the proposed change should be reviewed and agreed to before the Work Order is issued. Work Orders can be issued early, with an extended completion date that will allow the Work to be on-going throughout the season. Another option is to break the Work into smaller portions either with separate Work Orders or separate due dates so that the Work can be completed within the timeframe in the Specifications.

Extensions are only issued under extenuating circumstances, with the approval of the Operations Manager. The Maintenance Contract Inspector may recommend that the Operations Manager extend the due date of a Work Order. All requests for extensions must be in writing stating the reasons and requested length for the extension.

For example, if the Contractor is already working at capacity to complete a project and an emergency situation arises where more Work of a given activity is required, then the original Work Order may need an extension. If the Department increases the Work quantities in an activity, then an extension may be appropriate for a CMA, or in the CMAs that would otherwise be expecting the resources to start Work on an activity in their area. If this occurs, then the Department and the Contractor need to review priorities, set a plan to do the highest priorities first, and schedule the rest of the Work. Extensions to due dates may be appropriate in these circumstances.

Under normal circumstances, especially when good Work Planning principles have been followed, due dates placed on Work Orders give the Contractors plenty of time to schedule and complete the Work. Weather is not typically an issue for most Work because a certain number of bad weather days are factored into the automatically-assigned due dates. Severe weather or extended poor weather may be a factor for consideration as it can affect the ability to do the Work, delay other Work or other associated projects, damage the Work, delay Subcontractors or suppliers on other projects, or cause other problems outside the scope that Contractors would normally factor into their scheduling.

3.3.9 COMPLETED WORK ORDERS

Work Orders may be marked as complete if Work is finished as per contract specifications or to the terms previously agreed upon for Extra Work, on or before the due date.

If the Work was started as proposed in the Work Planning document, or as soon as significant external conditions (e.g., weather, etc.) permitted, and can no longer be physically completed

prior to the due date set out in the Work Order, the Work order due date may be extended (see Section 3.3.8).

If the Work was not completed for reasons other than listed above, the Operations Manager will consider the "value" of completing the remaining Work. Value is determined in terms of impact on achieving level of service targets and satisfactory outcomes for the Work. If there is still value for continuing with the Work, the Contractor is expected to continue with the Work as long as it is feasible and reasonable to do so. Critical Work Orders will remain open until they are completed or until the end of the fiscal year, whichever comes first. For non-critical Work Orders not completed on time and greater than or equal to 80% complete, the Contractor may request them to be closed at the end of the season. Late non-critical Work Orders less than 80% complete will not be closed until the end of the fiscal year. If the Operations Manager wants this Work to resume in the spring or summer season of the next fiscal year, then the Contractor is requested to provide an acceptable plan for restarting and completing the Work (usually as soon as practical). The Work Order shall be re-issued on April 1 of the following fiscal year, with the new due date marked the same as the original due date.

Work Orders with the following Work items are considered critical:

- Supply Winter Sand/Salt Mixture/Ice Control Materials
- Line Painting
- Pothole Patching by Hand
- Surface Patching
- Regravelling
- Dust Abatement

3.3.10 CANCELLING WORK ORDERS

A Work Order may be cancelled for the following reasons:

- when a duplicate has been made for the same Work
- if there were significant errors on the original Work Order
- if the scope of the Work changes to a point where the Work required is significantly different from the original Work Order (see Section 3.3.7)
- if the Work has not been done and is no longer required, providing it is not overdue. If overdue, it should be marked as "closed but incomplete".
- Department fiscal year-end of March 31 has been reached, and the Work no longer needs to be done
- the term of the Contract has expired
- changes in budget allocations
- amended Work priorities due to emerging situations in the season. (e.g., other Work required as a result of flooding, etc.)

3.3.11 CLOSED BUT INCOMPLETE WORK ORDERS

Work Orders should be marked as ***closed but incomplete*** only if the Work is overdue and a portion of the Work can no longer be physically done (e.g., because of extreme weather, or weather that prevents satisfactory outcomes to the Work (e.g., winter for some Work, etc.) or Work is not needed at that time). There is no guarantee that the Work Order will be extended or re-issued next season. Other priorities may be addressed instead, with consideration to overall provincial objectives.

The Maintenance Contract Inspector and the Operations Manager may discuss or suggest how the funds can be reallocated to another activity. If the Work is no longer appropriate (for example, the season has changed and the Work would no longer be effective or the desired quality could not be achieved), then the MCI and OM may want to look at using the funds in a more appropriate place.

3.3.12 OPEN AND OVERDUE WORK ORDERS

If the Work is overdue but still needs to be done, then the Work Order shall remain ***open and overdue.*** All Work Orders are assigned due dates and the Contractor is expected to meet those dates, particularly when there is a mutually agreed Work Plan in place. If he doesn't, then the Work becomes overdue, unless the Contractor has made a valid case for extending the due date. By tracking the completion dates, the Department can evaluate performance by measuring how much Work is completed by the specified due dates.

3.3.13 OVERDUE WORK ORDERS COMPLETED BY OTHERS

If the Work is overdue and can still be physically undertaken, then the Department may get someone else to do the Work. This will not relieve the Contractor of their contractual responsibilities for the Work.

NOTE: Through the use of a report in PMA, the Department is able to keep track of the overdue Work Orders. Department staff must ensure that their personnel responsible for issuing Work Orders are counting overdue Work Orders and overdue days in a consistent and fair manner. Standardized measurement of overdue Work is an effective performance-measuring tool.

3.3.14 WORK ORDERS WITH EXTRA WORK ITEMS

Reference: Spec. 51.2.28 Extra Work

Extra Work includes Work not specified in the Contract, or Work for which there are no bid items. It is processed like any other Work Order. However, since there are no specific bid items, the activity code is used as the bid item. (The numbers signify that the Work is user-defined and specific to that Work Order.)

If the activity is used on a regular basis, then it would be a good candidate to become a bid item. This is most likely to occur if the scope of Work can be readily defined and has a reasonably definable and measurable unit of measure (see Section 3.3.15 Creating New Bid Items) However, the Department has to approve this proposed change to the Contract using the standard provincial procedure for creating and approving new bid items.

The rest of the procedures for Work Orders must be followed.

Further discussion on Unit Price Changes and Pricing for Extra Work can be found in Section 4.

Before the Work starts, the scope of Work needs to be clearly defined and reviewed with the Contractor. The estimated cost of the Work should be established. The required and appropriate resources (manpower, equipment, materials and/or Subcontractors) should be reviewed to ensure that the expectations for undertaking the Work are understood. Ideally, the Department and Contractor should review the various options for doing the Work to ensure they are using the one most likely to achieve the best results and best value in most circumstances. Start and completion dates should be negotiated so that Work is done as required by AT, in a timely manner, and with specific expectations regarding warranty.

All Extra Work Orders must be approved by the Operations Manager upon recommendation from the MCI and/or OE (according to the Department Authorities Matrix) before they are issued to the Contractor. Higher levels of approval may be required depending on the overall costs and details of the Work.

The OM may request additional information to ensure that the Extra Work will provide good value to the Department. It is critical that Department forces make their expectations clear regarding the Extra Work. Providing estimates for Extra Work can be extremely time-consuming for the Contractor, so it is important to clearly outline the expectations for the Extra Work proposal. For some Work, the Department may be looking for a minimum of 3 prices for a component of the Work. If it is possible to obtain 3 quotes, the Contractor shall include this in their proposal. In some cases, it is not always possible to obtain 3 quotes. In those cases, the Contractor should identify the reasons for this situation; e.g., potential Subcontractors are too busy to provide pricing, timeframe is too short for some Subcontractors, Work expectations are out of their capacity or capability to submit pricing, or there is only one source available or capable of doing the Work of that type or in the timeframe available. The Contractor needs to review this with the Department to ensure this is acceptable. Of course, the more time the

Contractor has to prepare the Extra Work proposal, the more likely they are to find Subcontractors and the greater the likelihood they are to find them at the best price.

It is also worthwhile to discuss the requirement for an estimate versus a quote. Using an estimate means that the cost of the Work can vary in accordance with work effort required and resources used. Estimates are lower risk for Contractors. Working using estimates necessitates closer scrutiny by the Department as per the Expenditure Officer Guidelines. Quotes are generally a fixed price for a fixed scope of Work. Therefore, as long as the scope of Work is as outlined in the request to provide pricing, the Contractor will provide a single price for the Work. There is increased risk to the Contractor in providing quotes, and some of that risk may be reflected in the price. Using a quote, if the scope of Work varies significantly from that originally requested and it results in extra costs to them, the Contractor may request additional compensation.

3.3.15 CREATING NEW BID ITEMS

When Extra Work; is done on a regular basis, is an activity that can be well defined, has a reasonably definable and measurable unit of measure, and has a reasonably significant quantity, a new bid item should be created instead of using the same ##00 Extra Work bid item repeatedly. The procedure for creating a new bid item is as follows:

a) The Operations Manager requests authorization (typically based on MCI recommendations) to create a new bid item in a memo to the Director, Highway Operations, Technical Standards Branch. This memo outlines what the new bid item is needed for, a short description of the new bid item, the proposed unit price, unit of measure, and all aspects of a specification (if it is not described in the specifications). Included with the memo will be all the supporting documentation to show how the unit price was determined, including relevant Contractor documentation supporting the bid item approval.
b) If the Director agrees with the request, the unit price approval is sent to the Director of Program Management Branch (PMB) for insertion into the existing contract. The PMB then replies by memo with authorization for the new bid item.

   If the Director does not approve the new unit price, then a memo is sent back to the OM with the reasons why the unit price was not approved, in which case the OM and Contractor negotiate another unit price and re-submit and/or review other options for delivery of the Work.
c) Upon TSB and PMB approval, the new bid item is created by the Administrator of PMA. Because PMA is Internet-based, all parties who are authorized to see the new bid item can view it and use it immediately.

3.3.16 PREMIUM PAYMENTS FOR URGENT WORK

The intent of the premium bid item is to provide the Contractor with extra compensation for the additional expense of disrupting originally-scheduled Work and mobilizing on short notice.

Highway Maintenance ***Specification 51.2.14.11 – Compensation for Accelerated Scheduling of the Work*** states "This premium payment 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."

When accelerated scheduling is required, there may be a need to discuss with the Contractor resource availability or other factors that may interfere with the ability to undertake the Work. In some cases, supply of materials may be an issue (i.e., asphalt supply in late fall or early spring), or there may be competition for resources (i.e., flooding damage, significant snow drifting in several areas, etc.) In those cases, it would be worthwhile to jointly develop a strategy to complete the Work to meet the desired objectives. (Possibly by providing traffic control in the short term until the resource issues can be resolved.)

While these directions are clear when the Work Order only has one item on it, it may be unclear for the following situations:

Situation 1 – Premiums for several activities in the same location

Premiums may be unclear when more than one item is ordered for the same urgent situation (for example, when debris removal, guardrail repair, and sign replacement are all ordered at a collision site).

If there are two activities and only one premium will be paid, the MCI is to pick the activity where the majority of the Work exists, particularly if the work uses the same resources (crew and/or equipment). Evaluate the situations on a case-by-case basis.

- If one work crew completes all of the Work, then only one premium is paid.

  For example, if four operators with a gravel truck and loader are flagging and cleaning up a gravel spill on the road and they straighten the guardrail at the same location using the loader and hand tools, then only one premium is paid, since only one work crew had to be mobilized to do the Work.

- If a different mix of manpower and equipment (different work crews) is mobilized for each activity, then a premium is paid for each activity.

  For example, if a busy divided highway has a sudden local pavement failure that requires immediate flagging (immediate traffic accommodation), followed by a hot mix grader patch later the same day, a premium is paid for both activities.

Situation 2 – Premiums for one activity at several locations

The same Work is ordered at several locations in one Contract Maintenance Area, whether it is written as part of one Work Order or several, to be done within the same short timeframe (for example, when the Maintenance Contract Inspector orders several paver patches within one CMA, to be completed in the same timeframe).

- If the same work crew does the same type of Work at several closely-spaced locations, then only one premium is paid.

Rule of thumb to decide if the Work is "closely spaced" is when the Work is all in the same maintenance shop area (even if the Work is not normally reported by the shop segment).

For example, three hot mix paver patches done at the same time and all within 20 kilometres of the Contractor's shop would only get one premium. This is a judgment call. Each area has to determine what "close" means, and there may be other factors (such as access to the worksite, road bans, resource restrictions, etc.) which may need to be considered.

3.3.17 ADDITIONAL ROAD INSPECTIONS

Reference: Spec. 53.37.7.2 Additional Road Inspections

Additional road inspections are described in the Specifications. The intent is for additional inspections over and above that outlined in the individual CMA's Special Provisions, and in most circumstances upon preapproval of the MCI. In some circumstances, the Contractor may be authorized by the MCI to undertake additional inspections outside normally scheduled times if they expect maintenance issues that may require action. These circumstances could be flooding, winter maintenance inspections outside of normally scheduled dates, or fire concerns. The Contractor is expected to notify the MCI in an agreed manner when they mobilize to undertake these inspections.

For example, on a road normally inspected 2 times per week (as prescribed in the CMA's Special Provisions), the Maintenance Contract Inspector requests 3 additional inspections in a week because the road is failing. Three Additional Road Inspections would be paid for by the kilometer.

3.3.18 AFTER HOURS CALL-OUT PAYMENTS

Reference: Spec. 53.39.7.3 After Hours Call-out

This type of payment is classified as a premium payment.

After hours call-out payments are used to compensate the Contractor for the following:

- ***if his staff is called out after hours***. After-hours is defined as outside of the hours 7:00 a.m. to 5:00 p.m., Monday to Friday. Statutory holidays are also considered to be outside regular business hours.
- ***and the reason for the response has not been covered in the bid items for their area***. An after hour call-out covers the cost of one staff member and a pick-up truck. This rate would apply to doing the Work, whether located near the shop or at some distance away.

The after hours call-out rate is a flat rate per callout.

The after hours call-out will not be paid if:
- the Contractor did not have to mobilize additional forces to respond
- the Contractor is already receiving a premium for the activity
- the Work could be paid under an appropriate bid item

If a member of the public calls the Contractor with a concern, as much information as possible should be obtained from the caller so an informed decision can be made as to whether or not the Contractor's forces should be sent out on an after hours call-out. The Contractor is to use their best judgment regarding response, and to notify the MCI or other authorized Department representative in an agreed upon manner, with an expectation that there will be follow-up and review of the response afterwards. It is important that the Contractor maintain a proactive approach to response; Department forces should not be critical to the extent that it significantly discourages Contractor response, which may result in them not responding when required. At some point in time the Contractor may undertake a response that is determined not to be entirely necessary after the fact. However, as long as this is a minority of responses, it is better to respond a little more than necessary, than not sufficiently when necessary.

***There is no after hours call-out in this situation*:** It's midnight and a dead deer is on the highway. A passing snowplow shoves the deer off the road, to be picked up later. In this case, the workers were already in the area, and no extra staff members were required to perform the task. The Work would be considered part of the plowing.

There is an after hours call-out in this situation: The police call at midnight to say there is a dead deer on the road. A crew goes out and removes the dead deer. The after hours call-out bid item would be paid.

3.3.19 FISCAL YEAR END

The Department fiscal year is from April 1 to March 31.

This section deals with Work Orders that intentionally span fiscal years (Work runs over 2 or more fiscal years).

Under normal procedures, Work Orders end at the Department's fiscal year end (March 31). A new Work Order would be issued beginning April 1st.

If no Work has been done on the Work Order, although it was issued before the end of the fiscal year, the MCI should close it and mark the quantity to zero. Then the MCI reissues the Work Order on April 1st, with a completion date that reflects a reasonable expectation for the due date.

If some Work had been done on the Work Order, at the end of the fiscal year the MCI closes the Work Order with an adjusted quantity equal to the amount of Work completed. He then reissues

the Work Order on April 1, with the remaining quantity with a completion date that reflects a reasonable expectation for the due date.

For accounting purposes, it is necessary to have all Crew Worksheets and Snow and Ice Worksheets processed with a completion date equivalent to the year-end cut-off date, which is March 31(which is set by the Department's Finance Department).

3.4 WORK RECORDS

3.4.1. INVOICES AND TRACKING WORK

The Contractor is required to provide data to the appropriate Alberta Transportation representative as per *Specification 51.2.14.2 Work Orders***.**

The Maintenance Contract Inspector has a key role in keeping financial control for the Department. Before a Contractor is paid:

- the MCI needs to review Crew Worksheets/Snow and Ice Worksheets from the Contractor.
- the MCI must verify quantities reported on the Worksheets. This helps the Department maintain financial control over the projects. Selective auditing of the Work, the information provided, and/or joint review with the Contractor are options to do this.
- the MCI must have a degree of comfort that the Work is appropriate, acceptable, and that the Worksheet matches the Work that has been done before he approves the Crew Worksheets for payment.

3.4.2. SNOW AND ICE WORKSHEETS FOR PLOW TRUCKS

Between 2004 and 2008, Alberta Transportation partnered with the Highway Maintenance Contractors to equip all snowplows with an Automated Vehicle Location System (AVLS). The primary objectives were to monitor and audit the Work being done by the Contractor (by the Department and the Contractor) and to increase productivity and efficiency through a newly-developed automated billing system.

The entire AVLS consists of two basic components – hardware and software. The truck-mounted hardware consists of a global positioning system (GPS) unit, a wireless communications device, and sensors that provide real time data input on the use of the plow equipment (plow blade actions, spreader controls, and pre-wetting actions). The software program developed specifically for this project collects snowplow data such as location, speed, truck identification, and actions, and automatically generates a billing record for AT to review and approve for payment.

See the link to the PMA Training Manual (Department) for more detailed information (TIMS Training at the bottom left side of the page).
http://aicm/Content/doctype28/production/index.htm

The AVLS website is accessed via user name and password.
http://beta.interfleet.com/albertabilling/

A summary of the process for creating, reviewing, and processing a Snow and Ice Worksheet is:

- AVLS creates the Snow and Ice Worksheet from information gathered from the sensors on the truck (one sheet per operator per truck per day). All sheets for a day are compiled and

uploaded into the AVLS server at midnight that night; at that point they can be seen on the AVLS website and reviewed. This sheet has a READY status.

- The foreman executes the Time Report in AVLS
- The foreman reviews the sheet in AVLS and corrects as necessary
- The foreman presses the "Submit" button in AVLS. The sheet is sent to PMA.
- The MCI reviews the sheet using the "PMA Review Batches" screen in PMA.
    - If acceptable to the MCI, the MCI changes the sheet status to ACCEPTED; it is ready for payment.
    - If unacceptable to the MCI but the issues can be resolved by the foreman, the MCI changes the sheet status to RETURNED TO AVLS. The sheet goes back to AVLS so the foreman can make the necessary changes and resubmit it.
    - If unacceptable to the MCI and the issues cannot be fixed by the foreman, the MCI changes the sheet status to REJECTED. The sheet goes back to AVLS so the foreman can see that it is rejected; the foreman will not be able to change it, so if necessary a new one will have to be created manually.
    - If the sheet has been reviewed but the MCI is not ready to accept, return, or reject it, he changes the status to PENDING; it will stay in PMA until the MCI accepts, returns, or rejects it.
- The Contractor extracts the ACCEPTED worksheets from PMA and creates an extract and loads batch files into their financial system
- The Department generates the progress estimate in PMA, and all ACCEPTED Snow and Ice Worksheets (along with all other Crew Worksheets) are tallied and paid.

Through the AVLS Automated Billing System, the Contractor supplies the following information (via the Snow and Ice Worksheet) to the MCI:

- the location where the Work was performed (winter segment(s))
- the Work Order number
- bid item
- operator
- the daily number of hours worked in each "winter segment" for each truck
- each truck's start and stop times
- salt and sand used in each segment, and source (based on how the Contractor labeled the shops/stock piles)
- predetermined comments from the list
- breaks taken by the Contractor (e.g., coffee breaks, refueling, or lunch breaks),. AVLS shows every break greater than 8 minutes. The Contractor labels the breaks as paid or unpaid.

The information on the Snow and Ice Worksheets must fulfill the information requirements as outlined in the Contract necessary for the Department.

AVLS Generated vs. Manual Snow and Ice Sheets

Starting September 1st, all Highway Maintenance Contractors (HMC) can begin commissioning their AVLS units inside the trucks by powering up the units and going through the checklist

sheet as provided by AVLS system supplier. The HMC needs to inform the supplier which units require repairs/updates prior to the start of the HMC's winter availability period.

The AVLS automated billing will be available from September 1st to April 30th for every season. The HMCs must submit AVLS worksheets during their contracted winter availability period. If they fail to comply, a manual worksheet penalty will be assessed (new bid item to be determined for PMA encoding).

There are some exceptions to this penalty and these are explained in the following Business Rules.

Business Rules for AVLS Snow and Ice Worksheets (updated Oct/08)

- AVLS generated Snow and Ice Worksheets must be used during the shop's winter availability period. The AVLS automated billing system will be available between September 1 and April 30 so HMCs are able to use it outside of the availability period as well.
- Penalty is assessed for each manual Snow and Ice Worksheet submitted (barring the exceptions listed below)
    - A negative bid item in the 1100 Activity series will be assessed monthly, accounting for the applicable number of manual worksheets submitted

Exceptions (when AT will accept manual Snow and Ice Worksheets without assessing a penalty):

- Approved trucks not equipped with AVLS (which only include units not on the AVLS supplier's/Alberta Transportation's master list of equipped trucks)
    - The supplier is able to provide this information to the Highway Maintenance Contractor and District Staff
- Work done outside of the shop's winter availability period
- The supplier, cellular phone provider, or GPS related system-wide catastrophic hardware/software failure; Technical Standards Branch Highway Operations will make the decision to temporarily allow manual sheets and will announce to all parties (the decision will not rest at the District level).
- AVLS sheet is missing or the sheet has errors in critical fields (see bullets) that cannot be rectified by the supplier or through PMA. The supplier is given 3 calendar days following notification by the HMC to fix any missing sheet error and the HMC has the opportunity to follow the accepted troubleshooting procedures (as provided by the supplier to the HMC). Critical fields:
    - Contract Number
    - Fiscal Year
    - Work Order Number
    - CMA
    - Truck
    - Date and Start and End Times

The following points are NOT considered exceptions to submitting AVLS worksheets:

- The AVLS hardware in the truck malfunctions:
  - GPS or communications component
  - Sensor component
  - Inaccurate spreader quantities

  The HMC is expected to have spare capabilities to handle such situations just like any other piece of equipment in their fleet.
- Incorrect Operator ID, Bid Item, or Segment Code on AVLS sheets

3.4.3 CREW WORKSHEETS

Crew Worksheets are used for the following reasons:

a) payment for any completed Work not covered under AVLS (Snow and Ice Sheets) – winter or summer
b) payment for Work in progress (for interim payments on a large project undertaken for a month or more)

Crew Worksheets are processed in PMA; the Contractor submits them in a timely manner. They are immediately available to the Department. These sheets record the following information:

- location where the Work was performed (segment)
- Work Order number, and which line item the Work is associated with
- quantities of Work performed
- unit of measure
- bid item (to record units, pay quantities, etc.)
- issue date, due date, completion date
- Contractor and contract number
- fiscal year
- completed status
- job number
- MCI
- comment section for additional information

3.4.4 HIGHWAY MAINTENANCE WORK RECORDING SHEET

Reference: Spec. 53.39.4.2.1 Scheduled Road Inspections

See Appendix 9 for the standard Highway Maintenance Work Record and Highway Work Identification Form.

Highway Maintenance Work is recurring, but much of the Work cannot be forecasted or scheduled. Highway maintenance inspections, culvert cleaning, and other activities are generally scheduled in accordance with the Special Provisions. The Department and the Contractor should review the Work and schedule it on a monthly basis at the monthly CMA meetings. Contractors

are paid a lump sum fixed rate per month for the inspections and the other HMW. The Highway Maintenance Work Record is a confirmation that Work has been done as part of the monthly Work. This Work is recorded on a Crew Worksheet, so therefore can be tracked in PMA.

This sheet is submitted to the Department weekly, or as determined between Contractor and Operations Manager. It contains information on HMW that has been completed by the Contractor. It records such tasks as road kill clean up, garbage pick-up, emergency sign repair, sign-and-guidepost cleaning and straightening, and other Work.

NOTE: The report provides information on the quantities of Work completed.

The *Highway Work Identification Form* is to be used by the Contractor to identify Work that may be required to the highway infrastructure. The content of the report is based on the drive-by daytime inspections of the highway. Knowledgeable personnel must be used for this reporting. The report is submitted to AT once a week or at a frequency otherwise agreed to by the Department and the Contractor. Potential Work may also be submitted by informing the Maintenance Contract Inspector verbally of this Work (this Work shall also be stated on the Report), by submitting a Proposed Work Order to the MCI through PMA, or identifying the Work in a CMA Meeting.

3.4.5 DATA FOR PROGRAM MANAGEMENT APPLICATION (PMA)

The Contractor is required to furnish data in a format compatible with Alberta Transportation's Program Management Application (PMA).

The Department collects data on the Work performed within each roadway segment. When this information cannot be gathered from the Work Orders or payment quantities, the Contractor is required to provide the information at no additional cost to the Department, or as otherwise mutually agreed in accordance with General Specifications 51.2.14.

The data collected from PMA is stored in the TIMS Data Repository (TDR), and is sometimes used by other TIMS applications. It is important to that the data reported in PMA is correct.

3.4.6 INVENTORY TRACKING RECORDS

The Department may have existing stockpiles of inventory from other Contracts or Work. Some Districts may selectively use and/or replace stockpiles, based on the most economic and sensible manner of management of those materials.

The Contractor shall provide records on how much Department-owned inventory he uses in his operations.

The inventory includes such items as signs and aggregates (sand or gravel) or any other stock which was not purchased by the Contractor and could still be used by the Department. Random checks may be performed by Department staff to verify quantities.

3.5 MAINTENANCE CONTRACT PERFORMANCE MEASURES

In 1998, a task group including members of Alberta Roadbuilders and Heavy Construction Association (ARHCA) and Alberta Transportation (AT) completed the initial *Maintenance Contractor Performance Measures* (CPM) document. Modifications have been made to the CPM document to update and improve the initial procedures over the years.

The document attempts to clarify the processes and reduce any inconsistencies that exist in the practice of CPM. It is not intended to change either the "Spirit or Intent" of the original document.

Contractor Performance Measures has three components; timeliness, safety, and specification compliance. The document clarifies procedures for all three components.

See Appendix 11 for the *Procedures for Maintenance Contract Performance Measures* document.

DEMERITS

Reference: Spec. 51.2.23 Default

3.6.1 PROCEDURE

Demerits are a financial penalty system that Alberta Transportation assesses on a Contractor for unsatisfactory Work or for significantly increased risk of public endangerment.

Only Regional Directors can issue demerits. The number of demerit points and dollar value of the demerit has to be defined in a letter written by the RD to the Contractor as per the specification.

Demerits are not issued lightly. There is a process that Department staff must follow.

- Say the Maintenance Contract Inspector notices a serious discrepancy or problem. Initially, he shall identify the issue in a timely manner and review the discrepancy or problem with the Contractor so that they have a chance to address it or correct the problem. If the Contractor does not seek to address the problem with the appropriate level of diligence, it may become a demeritable concern. The MCI then identifies the problem to the Operations Manager and collects documentation to back up the validity of the concern. It is important the Department forces distinguish between honest mistakes and omissions in the Work or the Work records, and those which are of much more significant concern.

  Documentation may include such items as a list of Work Orders not completed on time, conflicting notes on items written in the MCI's diary vs. Crew Worksheets or invoices provided by the Contractor, discussions with the Contractor regarding processes to resolve the concern, etc.

- The OM reviews the documentation provided. If the proper supporting documentation is in place and if it is a demeritable issue, then the OM recommends the RD issue a demerit.

  The OM may check with other OMs, the OPMC, or other relevant Department personnel to ensure consistent handling of these delicate issues.

Demerits can be issued for the following reasons, given that they occur without valid extenuating circumstances or outside of reasonable expectations for the Work or management thereof:

- failing to do Work
- failing to promptly pay creditors
- failing to repair a defect
- failing to perform Work adequately
- failing to keep available sufficient, trained, and experienced snow plow operators
- failing to maintain minimum required snow removal equipment on standby
- providing false documentation
- not redoing Work when required

- compromising the safety of the travelling public
- 20% Late Report is exceeded
- EMP non-compliance

NOTE:

- ***Reference: Spec: 51.2.23 - Default*** of the *Standard Specifications for Highway Maintenance* must be met.

- The Contractor may appeal the demerit. The Program Management Branch (along with Technical Standards Branch – Operations) will investigate all information. A final appeal may be submitted as per the Dispute Resolution Process for Alberta Construction Contracts.

3.7 WARRANTY

3.7.1 THE CONTRACTOR'S GUARANTEE

As outlined in the *Standard Specifications for Highway Maintenance*, each activity has a defined warranty period. The Contractor guarantees the Work will be free from any defects or failure due to the Contractor's neglect, faulty workmanship, or faulty material.

The Work needs to withstand climate, maintenance, and normal operating conditions.

3.7.2 PROCEDURE FOR TRACKING WARRANTY WORK

After the Department has accepted that the Work is complete as per contract specifications, the warranty period begins. The Maintenance Contract Inspector may need to physically inspect these worksites and identify any failures in the Work. If any failures are found, they are to be reported to the Contractor so they can review the Work and so that remedial action may be taken in a reasonable timeframe.

If a failure is found within the warranty period, the MCI and the Contractor should discuss the problem. In documenting the warranty Work necessary to fix the failure, the MCI needs to generate a new Work Order, following this procedure:

a) Using the PMA system, create a new Work Order
b) Specifications call for the Work to be completed promptly and before the end of warranty, however the Operations Manager may allow for an extended time to complete for extenuating circumstances
c) Check the box that indicates it is warranty Work.

In the PMA program, MCIs can track Work that is still under warranty.

Once the warranty Work has been completed, the Contractor submits a new Crew Worksheet that advises the MCI that the Work has been completed. There is no additional payment associated with this warranty procedure. The original warranty period is not extended due to the repair Work.

NOTE:

- When Work is originally performed, the Contractor and MCI may agree that a warranty should not apply or a full warranty is not reasonable because of specific circumstances surrounding that particular Work. These exceptions need to be documented on the Work Order. Ensure that both the Contractor and the Department have a record of the agreement.
- If extenuating circumstances occur during the course of the Work, the Contractor should review them with the MCI, and discuss the implications to the warranty. The agreement should be documented for future reference in the event the Work fails to perform as required.

- The Contractor performs the Work. If the Work later fails because of extenuating circumstances, then the circumstances should be communicated to the MCI/Operations Manager. The MCI/OM would then decide if the warranty was applicable. Communication is the key.

- The Contractor must track warranty Work and correct deficiencies in a prompt manner, or as otherwise agreed.

3.8 CONTRACT CLAIMS, NEGOTIATIONS, AND DISAGREEMENTS

3.8.1 OVERVIEW

Partnering and its associated dispute resolution process are to be used in the Maintenance Contracts to help prevent many of the formal claims. However, because contracts are not perfect documents, disagreements may arise and negotiations may be necessary. The Operations Manager and Contractor should negotiate to avert or resolve disagreements wherever possible. The Contractor and the OM should not feel pressure to negotiate if demands by either party are considered unreasonable.

The Department and Contractor must always document events as if they were going to court. An example includes, but is not necessarily limited to, the items listed in the MCI's diary subsection of this manual, the Contractor's diary, photos, and video tapes.

Formal claims are a final means to settle disagreements between the Department and the Contractor.

3.8.2 PROCEDURE FOR CLAIMS AND APPEALS

Reference: Spec. 51.2.60 Claims and Dispute Resolution

The claims resolution process applies to claims from the Department or the Contractor.

The *General Specifications* section of the *Standard Specifications for Highway Maintenance* outlines the procedure that both parties follow when a claim is made.

The claim review process has three levels:

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

If any level of the process determines that the claim has some validity and the Contractor/the Department is entitled to some form of compensation, then the reviewer will attempt to negotiate a tentative settlement.

If the proposed settlement requires a change to a term or condition of the Contract, then approval in principle must be obtained in advance from the Executive Director, Program Management Branch, before starting negotiations. The submission to the Program Management Branch must be accompanied by a recommendation from the Regional Director.

Both parties need to keep the following in mind during the claims and appeal process:

- The Managers need to apply fair negotiations and fair judgement when dealing with disputes.
- The Contractor's Work needs to be well-documented.
- The Department and Contractor staff must know the Contract thoroughly**.** Review the Contract document, including Contractor's response to the Work Execution Plan in the original bid package.
- The field staff need to Work closely with management.
- Managers should advise the field staff of the process to be followed for First Party Claims submitted by a Contractor.

Neither party can have access to the other party's correspondence or files (diaries included), except specific information relating to progress estimates and quantity measurements. Neither party can give assistance, information, or advice to the other to help him formulate the basis of his claim.

When a party is following the claim review process, he must follow each level in sequential order (one through three). Once he has received a decision from a claims level, he may submit the same claim in writing to the next level, and must indicate why he disagrees with the previous level's opinion. The Department or the Contractor cannot introduce new items or issues that have not been reviewed by the previous level. If new items are introduced, then the claim should be submitted in writing back to the first level for review. Each claim would then be reviewed independently, unless the Department and the Contractor agree otherwise.

3.8.3 LEVEL 1 CLAIMS

When a claim is received at Level 1, each Manager should notify his managers of the claim. For the Department, that would be the Regional Director and Executive Director of the Program Management Branch (PMB); for the Contractor that is their Contract Manager's superiors. The Managers will attempt to negotiate a tentative settlement. If an agreement can be reached, then the proposed settlement, along with a written report, should be forwarded to PMB for approval. The proposed settlement must be accompanied by a recommendation from the RD.

If the Manager cannot reach a tentative settlement, or believes that the claim is not valid, he will notify the other party in writing that the claim has been rejected, giving reasons for the rejection. In the letter, the Manager needs to advise that if the other party disagrees with the response, he may resubmit the claim to Level 2. Copies of this letter should be submitted to the RD and PMB.

3.8.4 LEVEL 2 CLAIMS

When a claim is received at Level 2, the Department's Regional Director should advise Program Management Branch and Technical Standards; the Contractor's appropriate parties should be advised. These branches of Alberta Transportation track claims and issues on a province-wide basis. This data provides the Department with feedback on existing specifications and testing

procedures because it identifies areas where revisions or further review are required. Information on all claim settlements is required to determine if a precedent is being set.

When reviewing a claim, the Regional Director/Contractor Manager have a number of resources available to them (i.e., the Maintenance Contract Inspector, Operations Manager, and branches of the Department like Technical Standards Branch and PMB, Foremen, Superintendents, Safety Personnel, etc.). The decision arrived at should be fair and fall within the parameters of the Department policy and the Contract.

If the claim is accepted at Level 2, then the RD/Contractor Manager, with assistance from the OMs, will:

a) arrange for all required approvals prior to formal acceptance of settlement
b) arrange for the Contractor/the Department to sign and seal a General Release, provided by PMB
c) inform the Contractor/the Department in writing (with copies to PMB and Technical Standards Branch or appropriate Contractor personnel)

If the claim is rejected, the RD/Contractor Manager need to notify the other party in writing of the decision (with copies to PMB and TSB and appropriate Contractor personnel) and advise them that there is one more level (Level 3) in the claims procedure.

3.8.5 LEVEL 3 CLAIMS

When a claim is received at Level 3, the Executive Director, Program Management Branch/Contractor Manager, starts an independent review. During the course of the review, before he discusses anything with the other party, he may call on the services of the Operations Manager, the Maintenance Contract Inspector/Superintendent/Foremen, or any other Alberta Transportation or Contractor employee who could provide assistance in resolving the dispute.

If the Contractor or the Department is still not satisfied after Level 3, he may, where applicable, proceed as outlined in the *Disputes Resolution Process for Government of Alberta Construction Contracts* manual, which outlines the procedures for negotiation, mediation, and arbitration.
http://www.justice.gov.ab.ca/drn/publications.aspx?id=1056

3.8.6 THIRD PARTY CLAIMS AND DAMAGE CLAIMS

3.8.6.1 Third Party Claims

In a ***third party claim*** (as defined in the Alberta Public Works Act), anyone working for or providing materials to the Contractor may file a claim against the Contractor. The list could include any or all of the following: a subcontractor(s), labourers, or others providing material or services on the Contract.

Procedure for third party claims – When a subcontractor, supplier, etc., files a third-party claim with Alberta Transportation, there is a time-sensitive process that must be followed. If the Maintenance Contract Inspector receives the claim, he needs to note when he received the claim in his diary, then pass it on to the Operations Manager the same day.

- Third party claims must be submitted **in writing.** Verbal statements are not sufficient.

- The OM must **immediately date stamp and forward** any submission to Program Management Branch.

- Claims must be acted on immediately because there is a statutory 90-day limit for filing claims under the Public Works Act from the last day the claimant worked or provided services or materials on site.

  Over the 90-day limit – Although the Public Works Act has a 90-day limit for filing claims, there is no time limit in the Contract itself. Therefore, a claimant should never be denied the opportunity to file a claim, even after the 90-day period has expired. (There is a similar 120-day limit in the labour and material bond for filing claims with the bonding company. The Public Works Act also states that a claim should not be filed within 30 days of the date the claimant last worked.)

- If the claim is legitimate and the Contractor is unable or unwilling to settle the claim, the Department may follow any of these courses of action:
  - determine the value of the claim and pay the claimant directly from holdback funds
  - pay the disputed amount into court for judicial determination
  - if funds are insufficient, refer the claim to the bonding company for settlement

3.8.6.2 Damage Claims

A ***damage claim*** (claim from the public) is a claim for injury, loss, or damage arising in connection with the Work or infrastructure. The most common damage claim is for cracked or broken windshields due to winter sanding.

Procedure for damage claims – Damage claims must be submitted in writing. The Department staff must follow this procedure for claims under $1500:

1. Claimant notifies Department that claimant's property has been damaged.
2. Department sends letter back to claimant advising that their claim letter has been received, via form letter A or B in Appendix 12
3. Department forwards claim to Contractor **OR** claimant notifies Contractor directly that Claimant's property has been damaged.
4. Contractor responds to claimant in writing with copy to the Department.
5. If Contractor denies liability, the claimant may come back to the Department saying he doesn't agree with the Contractor. The Department will forward a letter advising the claimant what his/her options are; see form letter C in Appendix 12. Attached to the letter

will be the Department's *Damage Claims Procedures* document, also located in Appendix 12.

6. Department forwards claim to the Adjuster.
7. Adjuster advises claimant in writing of his decision, with copies to the Contractor and Department.
8. If claimant disagrees with Adjuster, claimant contacts the Department.
9. Department advises claimant that if he is dissatisfied with the Adjuster's decision he should pursue the matter through legal avenues like small claims court or deal with it as an insurance issue through his insurance carrier.

NOTE: If the damage is GREATER THAN $1,500 it CANNOT be forward to the Adjuster. In that case, if the claimant comes back to the Department saying he doesn't agree with the Contractor's decision, the Department advises the Claimant that the Department can do nothing further for him and if he wishes to pursue the issue, his course of action would be to take the Contractor to court or have his insurance carrier try to resolve the issue.

Under the terms of the *General Specifications* of *Standard Specifications for Highway Maintenance*, the Contractor is required to review any damage claim received, then respond to the claimant in writing, with a copy to the OM.

The *General Specifications* section also outlines a third party evaluation process for disputed minor damage claims of value less than $1,500. Where the claimant disagrees with the Contractor's response, the OM will refer claims of less than $1,500 to an independent adjuster for evaluation. This independent adjuster deals with each claim on an individual basis, getting comments from both sides. If the adjuster agrees with the Contractor's response, the Department pays the adjuster's fee. If the adjuster disagrees with the Contractor's response, the Contractor pays the adjuster's fee.

Once the Contractor has responded to the claimant in writing stating his position, the Department, with the exception of the above noted minor damage claims, considers the matter closed. For cases where the claimant disagrees with the Contractor's response or the adjuster's response where the claim is less than $1500, the OM will suggest that the claimant consider other (legal) avenues to resolve the dispute.

The claimant is not to be provided with the Contractor's insurer's name. The claimant has the legal right to obtain the insurer's name from the Contractor but not from the Department.

If the MCI receives a request for information regarding a claim, the request should be forwarded to the OM.

3.8.7 REVIEWS/AUDITS

Program Management Branch of Alberta Transportation may perform audits of the maintenance Contracts and Contractors. Usually, the Operations Manager requests this group perform audits of a particular part of the Contract, but an audit can also be started by a request from the OPMC, a Regional Director, or any Assistant Deputy Minister.

Audits by PMB will look at Work done within the Contract; Work done by the Contractor for others is not included unless it clearly affects how the Contractor does Work for the Department. An audit can also look at Work done by a Subcontractor.

Auditors rely on written records of past events. If the Maintenance Contract Inspector believes that the Contractor is misrepresenting the amount of Work done or is not complying with some part of the Contract specifications, he needs to clearly document the details so that an auditor could easily cross-check with the Contractor's records. In particular, the MCI's daily diary is an important source of information in any audit.

Because the Contract allows the Department employees to look at the Contractor's records, an auditor's help isn't usually needed for simple disputes. However, a request for an auditor's assistance should be considered for complex or very detailed inquiries. If the MCI is not sure about the right action to take, talk it over with the OM, or seek advice from the Audit section.

SECTION 4 HIGHWAY MAINTENANCE ACTIVITIES PAGE

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4.0 QUALITY CONTROL / QUALITY ASSURANCE (QC/QA)

4.0.1 GENERAL APPROACH

Quality Control – operational testing the Contractor does to ensure the material/Work is in compliance with the specifications during the performance of the Work or immediately upon completion of the Work.

Quality Assurance – testing that may be performed by the Contractor or Department to verify the results of the quality control testing.

Maintenance Contract Inspectors are not expected to perform quality control on projects; quality control (and in some cases, quality assurance) is the responsibility of the Contractor. However, each MCI needs to assure himself that the Work quality is within the specifications. He should review the information provided by the Contractor and spot-audit as appropriate.

An MCI and Contractor can assess the quality achieved by using the methods outlined in this section and by working together to resolve issues as they occur. The methods of testing, frequency of testing, and overall approach are not carved in stone, but they do require the MCI and Contractor to have an in-depth knowledge of the following:

- specification requirements
- Alberta Roadbuilders and Heavy Construction Association (ARHCA)/Alberta Transportation Quality Control/Quality Assurance process for minimum standards
- materials quality test results
- ARHCA/AT *Failure Definition Handbook*

  ARHCA Highway Maintenance Contractors and AT jointly developed a booklet called the *Failures Definition Handbook* as a guideline to determine whether the Work under discussion is acceptable. This book supplements the specifications, but does not supersede them. See Appendix 13 for a copy of the *Failures Definition Handbook*.

The required frequency of quality control and assurance testing is outlined in the Contract (Special Provisions and Performance Measures documents).

4.0.2 PROJECT REVIEWS

Maintenance Contract Inspectors need to ensure that all Work is done correctly, using approved quality guidelines and safety procedures.

Not all Contractors' organizations are structured the same way. If the organizations differ significantly than outlined in this manual, the Operations Manager and the Contractor's representative need to decide who should be represented at each level for discussion.

Pre Start-Up Meetings. They are beneficial to outline and identify unique characteristics of the project and clarify expectations of both parties. It is a good opportunity to identify the inherent difficulties of each project.

> ***Review project objectives.*** Project objectives different than those of provincial specifications, safety, and timeliness need to be agreed to before, and reviewed during, the work process. These discussions allow Alberta Transportation and the Contractor to develop a common understanding of the objectives. Without a common vision of the Work, there could be conflict.
>
> ***Develop joint agreements between the MCI and the local Foreman.*** There is a section of the *Failure Definition Handbook* that deals with this process. It indicates that local conditions, traffic patterns, and past practices may set a guideline for expected quality. The MCI and the Contractor should review the situation and reach agreement on what is expected for Work quality. However, such an agreement can not exceed the Specifications. If there are problems with the Work, the review should help both sides reach agreement on whether the Work has failed and/or could be expected to fail, given the prevailing conditions.

Provide on-going feedback. The feedback process opens the door to discussions as the Work progresses, rather than after it has been completed.

On-going feedback creates a good business atmosphere for the following reasons:

- It provides the Contractor with on-going positive or negative feedback, increasing the opportunities to fix problem areas as the Work is being done. It is less expensive to fix a potential problem area as it is being worked on rather than mobilizing to fix any problems later.
- Even if the Work is being done acceptably, there may be cost- or time-saving improvements that could be made to the Work or work methods.
- Negative criticism of the completed Work tends to create conflict, especially if the Contractor believes his staff did the Work correctly. MCI input should be given in a timely manner so that the Work can be corrected with as little extra cost or work disruption as possible.

Resolve differences in opinion quickly. If problems cannot be settled quickly at a local level, it may be necessary to draw additional resources from both sides to resolve the concerns.

If the problems cannot be resolved with additional information or within an agreed time frame, a mutual decision should be made between AT and the Contractor that the problem be escalated to the next appropriate level (as determined in the partnering resolution process), as soon as possible.

For example, ***develop a joint agreement for pavement repair warranty***. A section of the *Failure Definition Handbook* discusses joint agreements for pavement repair warranty. It indicates that there may be circumstances where a patch would not be expected to be a long-term solution to a specific pavement repair. When AT and the Contractor agree that the repair cannot be expected to last for the full warranty period, they should agree on a reasonable warranty period for the Work. If they cannot reach agreement on the warranty, the issue should be escalated.

There may be reasons for ordering Work that has a high risk of failing before the warranty period ends. For example, it may allow for lower-priced but shorter-lived Work to be completed — surface patches vs. deep patches. When this happens, both sides understand the risks, and should be able to reach an agreement on what is expected before starting the Work.

4.0.3 ON-SITE WORK INSPECTIONS

Visit the work site as often as reasonably possible. When the Maintenance Contract Inspector and Foreman visit the work site more often, both sides have a clearer understanding of the challenges with a specific project. As a working relationship develops over time, the number of site inspections may diminish as the following occurs:

- both sides better understand the dimension of the Work
- both sides become more comfortable with the quality achieved

The Contractor has the responsibility to inform the MCI where and when the Work is taking place.

Visit the Work site early in the project cycle. Concerns are easier to address when they are identified early in the Work. Once the crew has demobilized from the site, it becomes more difficult and costly for the Contractor to correct any deficiency.

Visit the Work site at random times. It is easier to obtain a full picture of how the Work is proceeding if the MCI visits the sites at various times, rather than a set time during the day. Certain activities that are done early in the day may not be done later in the day.

Visit the work site together. This allows both parties to obtain a common view of the Work.

4.0.4 DEFICIENCIES

When deficiencies or problems are identified as early as possible during the course of the Work, there are more opportunities to change the existing Work methods. If a problem is noted after the job is complete, the Contractor may have to redo the deficient Work. This gets even more expensive when the crew and equipment have been disbursed to other work sites and have to be recalled.

- If there is a difference of opinion or an ***apparent deficiency***, the Contractor may be able to explain the situation to the satisfaction of the Maintenance Contract Inspector.

- If there is an ***actual deficiency***, viewing the Work together allows both sides the opportunity to agree on what the problem is. Once the problem is understood, it may be easier to develop a solution that both sides can agree to.

4.0.5 WORK FAILURE

When a Maintenance Contract Inspector observes that Work has failed, he should:

- identify specific problems with the Work
- consider the discussions outlined in the appendix of the *Failure Definition Handbook*, which summarize the discussions that occurred in the Failure Definition Committee; review the sections on materials testing, remedial measures, and warranties
- document the failures
- determine the significance of the failure
- determine whether warranty Work is required
- provide information and review with Contractor and Operations Manager
- work with the Contractor to determine remedial measures
- the completed Work must meet specifications
- review repaired Work
- establish whether penalties are appropriate
- provide feedback for review at the next Operations Meeting

4.0.6 MATERIALS TESTING

Random Material Audits

Several specifications outline how materials used by the Contractor should be sampled. *(e.g., Reference Spec 52.7, Supply and Stockpile Sand*) Some specifications set out the standards for material acceptability and whether penalties apply if the standards are not met. It is the Contractor's responsibility to do all quality control material sampling and testing as described in the specifications/special provisions, and notify the Engineer of any materials that do not comply.

The Maintenance Contract Inspector may perform random audit tests to ensure that the material meets specifications (quality assurance).

- The MCI should identify any sub-standard or faulty material to the Contractor as soon as it has been identified, so appropriate action may be taken.
- If the test results are marginal or controversial, the MCI should review the results with the Operations Manager in a timely manner before communicating with the Contractor, to confirm the appropriate course of action.
    - Additional material tests may be required where the test results are marginal or where additional confirmation is needed on the sub-standard quality of the material.

- The MCI should examine the Contractor's documentation on such items as quality of chemicals, quality sheets for line painting, and the results achieved on any testing the Contractor may have performed.

If the quality is unsatisfactory, the MCI has several options:

- Discuss the problem with the Contractor (talking it over at a local level).
- If agreement cannot be reached, the MCI and Contractor should jointly sample the disputed Work or material, as appropriate (i.e., guardrail or crack sealer) and discuss it again, if necessary.
- If agreement still cannot be reached on quality of Work, quantity of deficient Work, or appropriate remedial measures, the problem should be escalated to the next level of authority as identified in the partnering relationship.

Retests and Appeals

All tests have margins of error. Therefore, the Contractor may request AT retest the material to verify the first test's results. Some specifications outline the process for retesting, while other controversial results may be dealt with through the escalation and appeal processes. Generally, if the retest verifies the original test, the Contractor may have to pay for the additional test.

4.0.7 FINAL INSPECTIONS

The final inspection should just be a formality because both sides should have already reached an understanding on what was required, discussed any problem areas, and taken appropriate steps to fix the problems.

Joint Final Inspections

The Maintenance Contract Inspector and the Contractor should inspect the project together, so they can collectively identify any problems. It is easier to look at a concern than to explain it with words, so whenever possible, arrange a site visit.

Both parties should document the results of the final inspection. If deficiencies (that are both specific and related to the specification) are identified, the solution should be discussed immediately. These deficiencies need to be brought up to the specification requirements in a timely manner.

NOTE: Some contracts may have a standard form for the inspection that focus on the typical areas of concern for each activity.

Individual Site Inspections

It isn't always possible or necessary to inspect the completed project together with the Contractor. There are also occasions where it may be useful for the MCI to inspect the site before meeting with the Contractor. In either case, it is generally useful for the MCI and the Contractor to inspect the site again together.

4.0.8 REMEDIAL MEASURES

Some of the maintenance activities have remedial measures outlined in the specifications. For other Work, the remedial measures are less clear and they depend on the nature of the deficiency. Both the Contractor and Alberta Transportation staff need to work together to achieve a common understanding of what needs to be done, and the standards being applied.

4.0.9 WARRANTY

Each specification identifies the warranty period applicable to the Work being performed. In special cases, the MCI and the Contractor may agree that local site conditions make it unlikely that the Work will last to the end of the warranty period. When this situation occurs, the two parties have the option of waiving or negotiating the warranty period to meet reasonable expectations. Also, a non-typical Work solution may be used to reduce costs. In these instances, the warranty may be changed to identify repairs that would be the responsibility of the Contractor.

Warranties for Extra Work are determined if required. The Maintenance Contract Inspector and the Contractor should acknowledge the warranties before the Work Order is issued and before the Work begins.

4.0.10 QUALITY ASSURANCE – SNOW REMOVAL AND ICE CONTROL

For each classification of highways, the Maintenance Contract Inspector is to verify with the Foreman the time that each storm ends and the time that the Contractor gets the roads into "good winter driving condition". The following guidelines are from the *Highway Maintenance Guidelines and Level of Service Manual (June 2000).*
http://www.transportation.alberta.ca/Content/docType34/Production/los_manual.pdf

Class	Traffic Volume	Time to Good Winter Driving Condition
Class A	> 15,000 AADT	6 hours
Class B	7,000 – 15,000 AADT	6 hours
Class C	5,000 – 7,000 AADT	8 hours
Class D	2,000 – 5,000 AADT	8 hours
Class E	1,000 – 2,000 AADT	12 hours

Class F	500 – 1,000 AADT	12 hours
Class G	100 – 500 AADT	18 hours
Class H	< 100 AADT	24 hours

These time frames are for a normal storm. Unusual weather conditions may make these time frames impossible to meet, which is acceptable in severe winter storms.

Good winter driving conditions exist when snow and ice have been removed from the driving lanes and excessive loose snow has been removed from the shoulders and centreline of the highway. Short sections of ice and packed snow are acceptable and can be expected between the wheel paths, as well as on the centreline (as defined in the *Highway Maintenance Guidelines and Level of Service Manual*).

Please refer to Appendix 14 for definitions of Good, Fair, and Poor driving and visibility conditions.

While the target is "good winter driving conditions", it may not be possible to achieve this in the specified time frame. Drifting or packed snow, freezing rain, or sudden temperature changes may hamper the workers, preventing them from achieving this. Care needs to be used in evaluating the Contractor's efforts with this process. It needs to be based on a reasonable expectation of what can be achieved.

The MCI needs to be aware of how the roads are being cleared by storm and by winter segment. The MCI needs to confirm, on a sample basis, information from AVLS (real time or post storm). There are two reports in Program Management Application (PMA) that the MCI can use to review the Contractor's winter maintenance activities: the *Plow Operator Report* and the *Post Storm Report*. The MCI can also contact the Foreman/Superintendent for snow control updates, and to provide him with any road condition updates he may be aware of.

If the roads are not attended to within the timeframes outlined in the specification and the *Highway Maintenance Guidelines and Level of Service Manual*, the reasons/rationalization must be discussed as soon as possible after the storm (including information from PMA reports, RWIS/weather reports, AVLS, etc.). If too much time lapses and other storms occur, it becomes difficult to remember the exact circumstances of the response and results achieved. If necessary, both sides should view the road together to discuss perceived deficiencies and appropriate responses.

See Appendix 4 for the *Severe Winter Storm Task Group Final Report*.

4.1 PROPOSAL REVIEW

4.1.1 REVIEW OF CONTRACTOR'S PROPOSAL

During the Request for Proposal (RFP) evaluation process, which determines which Contractor obtains the Highway Maintenance Contract for a given area, the Contractors are requested to provide information through a Work Execution Plan (Envelop 2). This plan should be reviewed periodically throughout the term of the Contract. The plan has several categories as outlined below:

Organization Chart	Work Planning	Winter Service Delivery
Contract Manager	Salt and Sand Storage Site Plans	Motor Graders for Snow/Ice Control on Paved Surfaces
Superintendents	Snowplow Truck Storage Sites	Repair of Equipment
Foremen	Environmental Management Plans	Staff Training
Equipment Operators	Salt Management Plans	Safety Plan

NOTE: The ***Work Execution Plan*** does not supersede the requirements of either the specifications or Special Provisions documents. It provides a guideline on how the Contractor intends to perform the Work to meet the minimum requirements of the Request for Proposal, unless reasonably agreed otherwise.

4.2 SPECIFICATIONS / UNIT PRICES

4.2.1 STANDARD SPECIFICATIONS FOR HIGHWAY MAINTENANCE

Each maintenance activity has a specification or a number of specifications in the *Standard Specifications for Highway Maintenance*. Maintenance Contract Inspectors and Contractors need to be familiar with these specifications because they outline both the standard to which Work is to be completed and the method for payment.

The *Standard Specifications for Highway Maintenance* manual is broken down into the following sections:

51 General Specifications
52 Winter Maintenance
53 Surface Maintenance
54 Roadside Maintenance
55 Miscellaneous Specifications

Standard Drawings and Standards for Signs can be found on the AT website (http://www.transportation.alberta.ca/587.htm).

These sections are further broken into individual specifications for the Work. (For example, *Specification 52.1, Snow Removal and Ice Control (Truck*), covers the snow plowing operations.)

NOTE: Different Contracts may use different versions of the *Standard Specifications for Highway Maintenance*, and some specifications have been amended. Ensure that the appropriate version of the specification and applicable amendments are being used for the Work in your Contract. By mutual agreement, migration to new specifications can be negotiated within the terms of an existing Contract.

There are also Maintenance Bulletins located on this website to provide updates. http://www.transportation.alberta.ca/3348.htm. These bulletins outline additions to specifications or clarifications to existing specifications.

4.2.2 SPECIAL PROVISIONS

Contracts between Alberta Transportation and Contractors contain Special Provisions that are also a type of specification. Where there is a conflict between a specification in the *Standard Specifications for Highway Maintenance* and a Special Provision, the Special Provision governs.

In the Special Provisions section of the Contract, there are a number of conditions that are unique to the Contract Maintenance Area. These Special Provisions typically provide information on, but are not limited to, the following items:

- **Provincial Highways** – provincial highways maintained (rural and urban)
- **Roads Other Than Provincial Highways** – non-provincial highways maintained (i.e., vehicle inspection stations (VIS), provincial park roads, rest areas, roads on Indian Reserves/Metis Settlements/Improvement Districts)
- **Other Infrastructure** – Alberta Environment infrastructure, ferries
- **Contractor Performance Rating System** – a document on annual performance rating
- **Highway Maintenance Work** – information on the expectation and requirements for highway maintenance work, including winter inspections
- **Snow Removal and Ice Control (Truck)** – specifies the number and type of plowing trucks required at each shop and their availability period
- **Supply of Salt and Aggregates** – identifies type and quantity of salt, sand, and gravel required
- **Special Requirements of Wing, Prewet Units, Underbody Plows, etc.** – requirements for special equipment for winter snow and ice control
- **Maintenance Facilities** – discusses Contractor leases for the government-owned facilities
- **Highway Clean-Up** – Annual Highway Clean-Up requirements
- **Supply of Materials** – requirements for materials to be available (i.e., delineator strips, red diamonds to mark bumps, etc.)
- **Location of Public Facilities** – rest areas, litter bins, and toilets
- **Maintenance of Traffic Control Systems** – requirements for maintaining AT traffic-control and pedestrian-activated signals
- **Additional Specifications** – additional specifications for Work such as ferry operations
- **Application of Price Adjustment Factors** – how and when to apply inflation factors
- **Coordination with the Previous Maintenance Contractor** – if taking over a new area, how to coordinate with the previous Maintenance Contractor to ensure Work gets done in the transition year
- **Environmental Management of Maintenance Facilities** – outlines the requirements for the design and operation of the maintenance yards
- **General Liability Insurance Premium** – outlines how Department will compensate Contractor if Contractor's yearly General Liability Insurance Premium is far greater than expected
- **Introducing New Technologies and Processes** – there is incentive for the Contractor to be innovative
- **Program Management Application (PMA)** – web-based computer program used to administer the Contract (write work orders, process crew sheets, make progress payments, create reports, keep track of budget/forecasts)
- **Surface Condition Rating (SCR)** – when and how to do this

4.2.3 SPECIFICATION AMENDMENTS AND SUPPLEMENTS

The Maintenance Contract Inspectors and Contractors are responsible to know of all the specifications and amendments applicable to their area. When in doubt about the status of a specification or amendment, they should check with their respective Managers.

After the general specifications are written, modifications can be made to correct errors, omissions, or to account for other factors. These changes make the specifications more accurately reflect the Work. Amended specifications replace that portion of the general specifications they refer to. Spec amendments are specific to each Contract.

Throughout the term of the Contract, there can be other amendments made to cover situations not foreseen when the specifications were originally prepared. These amendments should be kept with the *Standard Specifications for Highway Maintenance* so they can be referenced easily.

4.2.4 MODIFICATIONS DUE TO CONTRACT EXTENSION PROCESS

As part of the process of extending the term of a Highway Maintenance Contract, certain specifications are reviewed and amended.

When changes are approved, the information regarding new bid items or unit price changes is made available to the Maintenance Contract Inspector through PMA.

For Contractors successful in acquiring an extension, the specification amendments govern.

4.2.5 SPECIFICATION REVIEW COMMITTEE

The Alberta Roadbuilders and Heavy Construction Association (ARHCA)/AT Joint Steering Committee set up the Specification Review Committee to review specifications and propose necessary amendments to the specifications. This committee provides solutions to identified specification issues. Once any agreed-upon specification changes are documented, formal notification of the changes are sent to the Operations and Contract Managers. The managers then forward them to the Maintenance Contract Inspectors and the Contractor staff.

If a specification does not adequately cover the Work, the MCI and Contractor need to work with the Managers to determine whether to:

- propose a change to the specifications (if the change is significant enough), or
- do the Work as Extra Work.

If, after reviewing the issue, the OM agrees that the recommended specification change has widespread implications for most Contracts, the OM will forward it to the Specification Review Committee and advise the Contractor. The proposed revision will then proceed through the specification review process.

If it is not judged worthwhile to make a province-wide specification change, the required change can be made for the Contract area only. Appropriate negotiations take place between AT and the Contractor at the manager level.

4.2.6 MINOR SPECIFICATION ISSUES

Sometimes, parts of a specification are not appropriate due to local circumstances. Special arrangements with the local municipalities or Indian Reserves/Métis Settlements must be taken into consideration. Some of these issues may be identified in the Special Provisions; others may come up during the course of the Contract.

Under these circumstances, there are two main choices:

- do the Work as an Extra Work item
- request a new unit price for the modified Work (for Work that is expected to be required several times)

Minor local specification issues can be dealt with by setting up a joint work group with the Contractor and Department to review the item. With both Alberta Transportation and the Contractor working together to resolve an issue, they should be able to reach a mutually-agreeable solution.

4.3 CONTRACTOR REALITIES

4.3.1 WORK DEFINITION

The following is an approach to contract maintenance from the eyes of the Contractor. This section should help the Maintenance Contract Inspector understand the Contractor's point of view and help develop a partnering approach to contract maintenance Work.

The MCI and Contractor need to discuss the Work, setting out the specific size and complexity of the job. The MCI and the Contractor need to clarify the expectations for the Work, and document it sufficiently so that they have an understanding as to what they have agreed to. The documentation should cover the following topics:

- **Scope of Work** — the MCI and the Contractor need to agree on how much Work has to be done. This includes information on estimated quantities of material required, the dimensions of the Work (i.e., length, width, and depth; information on sideslopes, backslopes, etc.), and other relevant information that fully defines the Work. When the Work is defined clearly, the Contractor can provide a work plan, quantity, and/or price (for Extra Work) that accurately reflects the Work under discussion.

  As a rule of thumb, smaller quantities of Work tend to be the most expensive for the Contractor to perform per unit of Work. On small jobs, there is a higher proportion of mobilization, preparation, clean-up, travelling costs, and risk in relation to the size of the project. However, for some Work, larger quantities are more expensive, due to industry availability and economic climate.

- **Quality of Work** — On items not clearly identified in the specifications, the MCI and the Contractor need to agree on the desired quality standard for the Work. This includes such factors as the type of acceptable material, sources of acceptable material (particularly gravel, sand, and earth), desired standards for final acceptance and required material testing information (if any).

- **Distribution of Work** — The MCI and the Contractor need to agree on the distribution of Work for any given project. It is more cost effective for the Contractor to do Work that is closely spaced compared to Work that is spread widely across the Contract area. When the Work is spread out, lower productivity and extra travelling costs will increase the total cost for the project to the Contractor.

- **Limits on Work Methods** — The Contractor decides which work methods will be used on a project. However, the MCI may provide input on work methods where past experience has shown that a certain type of equipment or method achieves or does not achieve acceptable results. (For example, compaction equipment may or may not be selected for spray patching, based on previous performance.) The MCI is not to direct the Contractor's Work.

The MCI should be careful not to set unreasonable limitations on work methods, equipment, or materials so as not to change the scope of the Work. Those limitations may trigger a request from the Contractor for changes to the unit prices or warranty period for the Work, which is usually not the intent.

The MCI may reasonably specify that certain methods or pieces of equipment are not acceptable (e.g., using Sandvik® tips to remove ice on paved highways). If the restrictions mean that the Contractor's costs will change, he may ask to adjust the price of the Work to reflect the change.

The MCI and the Contractor need to review the proposal so both sides can reach agreement on the implications and feasibility of the work method to achieve the desired objectives.

- **Payment Method** – The MCI should work with the Contractor to determine the most appropriate method of payment for Extra Work. The options should be in easily measured, definable units such as unit prices, hourly, lump sum, or a combination, depending on the Work being undertaken.

- **Safety Requirements** – Safety and traffic control is primarily the Contractor's responsibility. However, the Department and the Contractor should work together to determine the appropriate safety requirements for a project, especially if safety procedures or traffic control strategies aren't well or easily defined for the Work.

4.3.2 SUMMARY OF FACTORS INFLUENCING PRICING

When the Contractor improves productivity, efficiency, and cost-effectiveness without compromising quality and safety, there may be an opportunity for the Contractor to provide better pricing to AT. Conversely, the Contractor may have additional costs and therefore require a higher unit price if the Work is issued in such a manner that productivity, efficiency, and cost-effectiveness are reduced for a given level of quality and safety.

The Contractor minimizes his costs by using an appropriate crew and equipment to achieve optimum productivity per unit of Work. The major factors are summarized below:

a) Work Scheduling

Contractors can provide better pricing if the Work is scheduled so that the volume of Work is kept relatively uniform from month to month or season to season. If the overall volume of Work varies widely, Contractors may face additional costs of:

- hiring and training new staff to cover peak periods
- renting or leasing vehicles for short periods
- purchasing extra equipment that is only needed for short periods
- hiring Subcontractors (where the Work could possibly be done by the Contractor)
- incurring extra costs for rush delivery of materials

Risks (and costs) increase when:

- skilled workers leave because they have uncertain work schedules and small amounts of Work for long periods of time
- newly-trained-but-inexperienced workers (e.g., snow plow operators) are on the job

While some Work is of higher urgency, there are often opportunities to schedule Work with the Contractor so that the overall balance of Work is kept at a relatively consistent level.

b) Project Size

Smaller projects are generally more costly per unit of Work because the costs for mobilization, demobilization, preparation, clean-up, travelling time, etc., are spread over a smaller quantity of Work. (e.g., 50 tonnes of patching may have similar costs for mobilization, demobilization, preparation, etc., as 500 tonnes of patching, so the smaller project has a proportionally larger cost per tonne than the larger project.) Keep in mind this in not always true, due to economic factors and unusual inflation rates for material and labour.

c) Project Work Breakdown

A project may have many small pieces of Work to do at different sites. It is generally more economical for Contractors to do a project that is only broken down into a few large pieces than to do the same quantity of Work broken into many smaller pieces. Each individual portion of Work will generally have its own costs for travelling, setup, and preparation for each site. (e.g., 500 tonnes of patching done as five 100-tonne patches are less costly per unit of Work than fifty 10-tonne patches because there are fewer setup costs and increased productivity achievable for being able to do the same amount of Work in fewer chunks.)

d) Work Distribution

Work that is located at widely-spaced sites will generally be more costly than Work that is located within a smaller area. If the unit price for the Work does not include direct payment for the travelling time, the Contractor needs to recover the costs of this time. (e.g., one pothole in each of 10 segments of highway is far more expensive for the Contractor to fix than 10 potholes in one segment.)

e) Work Timing

It is preferable to do all of the Work of a certain type (e.g., paving) in a given area at the same time, rather than having to return several times in a season to complete the Work. Mobilization costs fluctuate relative to the quantity of Work undertaken, and setup times are increased. While working in this manner cannot always be prevented, it is desirable to make every reasonable effort to combine similar Work. A joint effort in the Work Planning process helps to schedule Work better.

f***) Risk and Uncertainty***

A basic view of maintenance outsourcing is that AT and the Contractor will share risk, placing it where it can best be managed. Risk and uncertainty have their greatest effect on the Contractor for unit price Work because the Contractor has agreed to do the Work for a certain price without knowing the actual working conditions and achievable productivity for each job.

A Contractor is generally willing to accept this if the Contract is administered fairly because, over time, the debits and credits of a Maintenance Contract will average out. A Contractor can provide better pricing when he understands, controls, and can account for the risks he may encounter. This is one of the reasons that representatives of the Maintenance Contractors are involved with the review and development of new specifications.

A Contractor and Department has the option to ask for a unit price review if the quantity of Work ordered exceeds 20% of the provisional quantity listed in the Contract.

Extra Work is much less affected by risk and uncertainty because the majority of the Contractor's costs are covered. Hourly Work also generally minimizes risk, because the Contractor knows that he will be covered for the crew's hours of Work. (When travelling time is not paid for, however, the Contractor has to cover the cost of travelling time in the hourly unit price. The risk rises when it takes more time to travel than estimated.)

A Contractor can adjust to some risks by lining up alternate Work that can be performed if his crews encounter difficulties. However, the Contractor may not be able to do this if the Work schedule or type of Work restricts the options.

4.3.3 RISKS THE CONTRACTOR FACES

If the Maintenance Contract Inspector works with the Contractor to understand and minimize the risks that the Contractor faces, the Contractor should be able to provide better pricing for the Work. The Contractor has varying degrees of control over these typical risks:

a) Changes to the Scope of Work

If the Scope of Work was clearly defined at the beginning of the project, it becomes a relatively straightforward process to determine how much the additional Work exceeds what was originally authorized. It also helps if there is an agreed-upon process of communication between the Contractor and the MCI when additional Work is identified/required. This needs to be done as early in the project as possible, so that everyone understands what is required and how it will be paid for.

Potentially, the greatest source of uncertainty is additional Work on a project beyond what has been reasonably anticipated. The MCI needs to work with the Contractor to determine how much time, equipment, and staff would be expected to accomplish the additional Work and how the additional Work will be paid for. If the scope changes because of unforeseen difficulties, it

may not be a significant issue for a project being performed as Extra Work, although it may be a significant issue for Unit Price Work.

b) Weather

Weather is not within the Contractor's control. However, a Contractor can minimize the impact of weather delays by being aware of forecasts and having alternate Work for their crews. They can also try to do less weather-sensitive Work when there is an anticipated risk of weather delays.

The Contractor may also face delays caused by weather-related damage to the Work. If there are extra costs associated with significant weather damage to the project, the circumstances and possible solutions should be discussed at the appropriate level.

The MCI can help minimize weather delays by:
- working with the Contractor to select suitable timeframes and completion dates for the Work
- recognizing the risk of weather delays for a given type of Work

The Operations Manager may authorize extensions for Work Orders when weather delays affect the Work, but this does not happen often and are generally for Work Orders with premiums. The time estimates allotted for specific Work in the specifications were developed to include a number of bad-weather days. At times, extra costs may be approved.

c) Material Supply

The Contractor may not receive materials on time or there may be interruptions in supply. While he may not have short term control over a given supplier, alternate suppliers that have a proven history of being able to supply on time can be chosen over the longer term. The MCI can minimize supply problems by ensuring that AT gives the Contractor (and therefore the supplier) adequate lead time. The Contractor should not limit himself to one supplier (for signs, for example) where large quantities are ordered throughout the year.

d) Material Quality

Material quality issues may delay a project. The Contractor has some control of material quality issues in terms of the supplier and material selected. AT staff may be able to help minimize material quality issues by working with the Contractor to identify the most cost-effective material suitable for the project. (e.g., various asphalt mixtures, aggregate gradations, etc.).

The Contractor may also run into problems with the following:
- on-site materials that may not be suitable for construction purposes
- poor ground conditions (such as saturated soils), which can cause problems with equipment and with not achieving a satisfactory end product

e) Site Safety Hazards

Each site has its own safety risks that usually fall into the following categories:
- injury to the travelling public
- employee safety
- damage to the travelers' vehicles
- damage to equipment or materials

The Contractor can minimize these risks by:
- employing an adequate Traffic Accommodation Strategy
- ensuring the appropriate safe work procedures are implemented
- using appropriate signs and other safety equipment

Even if the Contractor has fulfilled all his safety responsibilities, the unexpected can happen. For example, motorists sometimes do not obey signs or other traffic control measures and can cause collisions or delays in the Work.

The MCI can assist by working with the Contractor to identify deficiencies and appropriate safety procedures for the project. A preconstruction meeting should be held to discuss unique safety requirements for non-typical Work.

f) Equipment Breakdowns

The Contractor faces an ongoing risk that important equipment will break down, causing project delays. This risk is almost entirely within the control of the Contractor because each machine should have a preventative maintenance program and a contingency plan that helps the Contractor obtain backup equipment to finish the project. However, it should be noted that some specialized equipment may not be easy to replace on short notice. Where a long delay is anticipated, the MCI can help by working with the Contractor to develop alternate Work options or Work methods.

g) Manpower and Scheduling

The Contractor runs a risk that key personnel won't be available for a particular task. This risk can usually be minimized by using other crew members, standby operators, Subcontractors, etc. The MCI can assist by working with the Contractor to ensure that the Work is scheduled in such a way that the peaks and valleys of the demand for manpower are fairly uniform.

4.3.4 OVERHEAD AND PROFIT MARGINS

Contractors need to account for overhead and profit margins in all Work they perform. Although they may not make profit on every activity, in terms of the Contract as a whole, they need to be profitable to ensure they remain a viable company. Typical items that need to be accounted for in some manner in the Indirect Operating Costs (IOC) are as follows:

- administrative, financial, and management personnel
- offices and office equipment
- utility and communication costs
- work estimating costs
- vehicle costs
- travel and other expenses
- safety and training
- quality control
- insurance
- facility leases and rentals
- meetings
- taxes

It should be noted that even for Extra Work, where some of the margins are specified contractually, these margins are not all profit to the Contractor. Many of the other costs listed above, that are not directly related to the Work in question, need to be covered before the actual profit can be determined.

Contractors need to ensure that they are making a profit on the whole Contract before they are willing to reduce unit prices for larger volumes of Work. While some Work items may make more profit than average, the Contractor will not be able to easily adjust the prices if he is losing money on other items.

The MCI needs to realize that the Contractor is most likely willing to make changes to unit pricing if there is a process of "give and take" that ensures the Contractor is reasonably profitable as the end result. Of course, Contractor's viability is only one of the goals of the partnership. Neither the quality of the Work nor safety can be compromised in the name of profits. It is generally not desirable to renegotiate a significant number of items, however it should be recognized that both parties may have issues with the pricing of the Work and there may be room for agreement. This is more likely to occur when the overall negotiations within the Contract as a whole consider the interests of both and are not perceived to be "one-sided" by the other party.

4.3.5 UNIT PRICE CHANGES AND EXTRA WORK

Most Work under the Contract should be completed using contract unit pricing. Profits are made through efficiency. The unit price is typically a blend between low, medium, and high productivity Work. When low productivity Work is paid for by unit prices and high-productivity Work is paid for by Extra Work, the Contractor will likely lose money on the low-productivity Work. At the same time, the specified Extra Work margins on the high-productivity Work would not be sufficient, on average, to allow the Contractor to be profitable on the Work as a whole.

Extra Work is a preferred option when there are no bid items to cover the Work, the Work cannot be clearly defined enough for it to become a new bid item, or the Work is not done frequently enough to become a bid item. There are also times when the specifications define a task as Extra Work.

Occasionally, the Contractor is requested to perform Work that is not entirely covered by the specifications. This situation may happen for any of the following reasons:

- **No existing specification** – There is no specification for the requested Work.
- **Inadequate specification for proposed Work** – The existing specification does not wholly cover the Work as requested. This occurs whether more or less manpower and equipment are required to perform the Work than would normally and reasonably be expected. A substantially different Work method may be needed or changes to manpower, equipment, and material requirements may be needed.
- **Provincial specification change** – The Specification Review Committee has finalized a specification change.

Given the previous conditions, the Contractor would generally be requested to do one of the following:

a) Provide a new unit price. Requesting a Contractor to provide new unit prices is generally valid under the following circumstances:

- **Large volume of Work** – There is an expectation that there will be significant quantities of Work done under this item.
- **Work performed regularly** – It is expected that this Work will be performed several times a year or would likely be performed regularly each year of the Contract.
- **Clearly definable Work** – It is possible to clearly define the scope of the Work before starting the project. Also, it is possible to determine a unit of measure that is relatively easy to measure and monitor.

When either the Maintenance Contract Inspector or the Operations Manager requests a unit price, the Contractor then provides his proposed price to the OM with documentation. The OM will either:

- agree with the proposed price and recommend it for approval to the Director of Program Management Branch (PMB), who will have the Director of Highway Operations (TSB) review and provide comment
- disagree with the proposed unit price change and return it to the Contractor for further review and discussion

If the price is approved, the Director of Program Management Branch will document the approval in a letter to the OM (and copy the Director of Highway Operations), who will forward this to the MCI and the Contractor. The MCI needs to ensure that PMA reflects the new price before any Work Orders are issued. The PMA Administrator will update the price (which can only be done if the Administrator has the appropriate documentation). The OM is responsible for the distribution of approved prices to the Contractor.

If the price is rejected, further negotiations are required to reach a satisfactory agreement.

b) Extra Work – this classification is generally a valid option under one or more of the following circumstances:

- **Small volume of Work** – the Work will only amount to a small value; generally in the range of a few hundred to a few thousand dollars, and is not defined under a bid item.
- **One-time project** – types of projects which are only likely to be done once or a few times within the term of the Contract.
- **Significant problems defining the scope of Work** — projects in which it is very difficult to establish a clear scope of Work. This also applies where it is difficult to find a unit of measure that will consistently pay for the Work reasonably and fairly.

Extra Work is generally considered to be a fair option by the Contractors because they have a reasonable assurance that:

- their costs will be covered
- risk is minimized
- they will make a profit

The MCI should review projects that are planned as Extra Work with the OM so that it is clear that the Work meets the criteria for that category.

4.3.6 PRICING FOR EXTRA WORK

Specification 51.2.28, Extra Work, specifies the terms under which Extra Work will be paid. The following options are available:

- **Negotiated unit price** – The Operations Manager negotiates with the Contractor to determine unit prices. This option works well when the scope of Work can be clearly defined and clear units of measure can be identified for the Work.
- **Lump sum price** – This can be used when the scope of Work can be fully identified. The Contractor needs to account for the amount of risk and the unknown factors that may come up during the project. More uncertainties usually mean a higher price. If the risk factor for the Work is too high, it is very difficult for the Contractor to submit a suitable quotation for the Work.
- **Payment for labour, equipment, and materials** – The balance of the Extra Work specification outlines how the Work will be paid for when labour, equipment, and material are paid for at specified rates or at the Contractor's cost plus markup.

4.4 DEPARTMENT EXPECTATIONS

The Department expects the Maintenance Contractors to deliver good value and service for the best possible price. While sometimes it may be less expensive to deliver Work not included in the Contract by going to outside agencies, it is expected to be less expensive to deliver the Work outlined in the Work Plan through the Maintenance Contractor. The Contractors are expected to achieve overall lower bidding because of the greater efficiency realized in delivering large and somewhat predictable amounts of Work and by certain freedoms in that delivery, (e.g., scheduling times and locations; sharing resources between CMAs or Contracts). Contract specifications and public safety, however, should never be compromised.

During Work Planning exercises with the Contractor, the MCI negotiates prioritization, timing, and quantities of Work to be delivered that season. There is some Work that must be completed by a certain time (e.g., stockpiling of winter ice control materials and line painting to help safeguard the travelling public especially through the winter season). All Work issued by the MCI for these time sensitive items must be completed to the satisfaction of the Department by certain dates or the Contractor will be subject to the penalties specified under the terms of the Contract, including demerits. Also, the Contractor must complete the agreed to Work Plan for the other items listed. It is not acceptable for the Contractor not to finish Work covered under the Work Plan except where the Work season has been unusually brief. Not completing Work resulting in a potential to jeopardize the travelling public is also unacceptable. In these circumstances the Contractor may be levied severe penalties.

While Alberta Transportation will make all reasonable efforts to help the Contractors in the pursuit of the Work, the Department's main focus must remain on the safety of the travelling public and ensuring a good return on taxpayers' dollars.

It is expected that the Contractor has carefully reviewed the Request for Proposal and based his unit prices and Work proposals accordingly. Prior to starting the Contract, the Department reviews the unit prices and if any prices appear to be unusually low based on other accepted similar unit prices and/or accepted industry rates, the Department and the preferred Contractor may attempt to adjust the unit prices, while keeping the overall Contract total the same. Once this is achieved, the Contractor is expected to perform Work issued by the Department according to the specification and at the accepted unit price regardless of the profit margin bid in for that Work by the Contractor. It is expected that there will be more profit margin built into some items than others due to the Contractor's bidding strategy. Profit margins are not a contributing factor when the MCI issues Work Orders. Nor shall any loss of profit be used as an excuse by the Contractor for requesting that Extra Work be used instead of an accepted unit rate.

If material cannot be procured or work cannot be performed as outlined in the specifications, the Contract unit price cannot be used. The Work will have to be paid for as Extra Work. It is also expected that inferior quality material or inferior Work done should not be paid at the full unit price. Any Work to be performed or material used that is not as per Contract specifications requires prior approval by the Operations Manager.

The Contractor's proposal will be similarly reviewed for placement of shops, crew, and equipment. Once accepted, the Contractor shall provide the minimum level of service, or better, for snow removal and ice control as stated in the proposal. The number of trucks, operators and equipment, and use of Subcontractors to be placed/used in a geographic area may not be changed without prior approval from the Department.

The Contractor and Department work in partnership to deliver maintenance work of high value on the highway network. The MCIs represent the owner, but their ultimate responsibility is to the ongoing safety of the travelling public. MCIs cannot accept any inferior Work or material that may jeopardize that safety. In addition, the MCI is a holder of the "public purse" and is bound by the Department's Expenditure Officer Guidelines.

When a quotation is received for performance of Extra Work by the Contractor, the MCI should always review the costs with a mind of how much it would cost for similar Work if tendered at that time, keeping in mind that mobilization is a large factor for any contractor when bidding for Work. Department guidelines and procedures call for 3 quotations to be received for Work greater in value than $250. If the Contractor is purchasing material on behalf of the Department using Extra Work, then he is also obligated to provide the MCI with three quotations for that material. In rare cases where the supply of material or equipment is limited, the MCI may accept less than 3 quotes with written rationale by the Contractor. In very rare cases (i.e., emergency situations) the MCI may allow the Contractor to proceed without 3 quotes.

SECTION 5 HIGHWAY MAINTENANCE ACTIVITIES BEST PRACTICES

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5.0 GENERAL

5.0.1 GUIDELINES

The *Standard Specifications for Highway Maintenance* and *Special Provisions* are the base documents for administering the Contract. In addition, guidelines and best practices have been set out to help the Department and Contractor manage the Maintenance Contract, and meet their goals and mandates. The specifications outline the required results (and sometimes methods) for the Work, and the guidelines and best practices assist in effectively achieving each of the following goals for both Alberta Transportation and the Contractor:

- Public Safety
- Worker Safety
- Accountability
- Quality Work
- Timely Work
- Cost Effective Work
- Positive Working Relationships
- Positive Public Relations
- Maintaining Budget Limits
- Reasonable Profit Margins

As the MCI and the Contractor work together and discuss issues that exist or develop over the life of the Contract, mutual goals should be met consistently.

5.0.2 A FRAMEWORK

Guidelines or best practices for certain activities are not intended to replace the specifications and Special Provisions. However, they add a frame of reference that helps new and experienced Maintenance Contract Inspectors, Field Support Technologists, Superintendents, and Foremen with their Work. The following sections highlight:

- how to administer certain specified activities within a Contract
- how to achieve the desired results by following best practices

5.1 WINTER MAINTENANCE

5.1.1 DEFINITIONS

Due Diligence: As an owner, Alberta Transportation processes must demonstrate that the Department is being duly diligent in ensuring the highway maintenance Contractors are meeting their contractual requirements for snow and ice control. The *Severe Winter Storm Task Group – Final Report* (see Appendix 4) outlines AT's responsibility for exercising due diligence (In the report, it is listed under Recommendation 13, Appendix H).

Average Snowstorm (as defined in the *Highway Maintenance Guidelines and Level of Service Manual*, June 2000):
An average (or normal) winter snowstorm is defined as one in which snowfall amounts range between three and eight centimetres, the air temperature is lower than –10°C, the wind velocity is less than fifteen kilometres per hour, and the road surface is frozen.

Good Winter Driving Conditions (as defined in the *Highway Maintenance Guidelines and Level of Service Manual*, June 2000):
Good winter driving conditions exist when ice and snow have been removed from the driving lanes and excessive loose snow has been removed from the shoulders and centreline of the highway. Short sections of ice and packed snow are acceptable and can be expected within the driving lanes between the wheel paths as well as on centreline.

The Severe Winter Storm Task Group Final Report uses the above definition for Good Winter Driving Conditions.

Currently, Alberta Transportation and the Contractors have decided on definitions for Good, Fair, and Poor driving conditions and visibility. These definitions are outlined in Figure 5-1.

	Good	Fair	Poor
Road Condition	- bare dry or bare wet or chemically wet* pavement in the wheelpaths - short sections of ice and packed snow acceptable - little to no loose snow on shoulders and centre line - ice and packed snow between wheelpaths and on centre line OK	- small amount of snow and/or ice accumulation on road surface and in wheel paths - drifting snow blowing over road surface - "finger drifts" of snow accumulating on shoulders and into driving lanes - some ice or black ice in predictable areas (bridge decks, hills, curves) - small amount of slush on the road surface	- significant amounts of snow and/or ice or surface, especially in wheel paths - drifting snow partially blocking driving lanes - slippery roads from freezing rain/ice build up/frost - black ice over long stretches of highway - roads rutted from snow/ice/frozen slush build up
Visibility	- unlimited, greater than 500 m	- partially limited due to snow (falling, blowing, drifting), fog, or rain - visibility between 500 m and 200 m	- restricted to less than 200 m due to snow (falling, blowing, drifting), fog, or rain

* Chemically Wet can be described as a pavement that is wet when the temperature is below 0°C because of the presence of salt.

Figure 5-1: Definitions of Good, Fair, and Poor driving conditions and visibility.

5.1.2 NOTIFICATION OF SNOWPLOW TRUCK STARTING TIMES

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

The Maintenance Contract Inspector and Contractor should agree how and when the MCI is notified that snowplow trucks have been dispatched.

Typical forms of notice are as follows:

a) **Phone calls and voice messages —** The MCI may request that the Contractor phone him either in the morning, during regular Work hours, or whenever the snowplow trucks have been dispatched. Generally, notification would be given at the start of the snowplowing operation for each shop and not as each truck is added to complement the operation.

b) **Other means (faxes, e-mail, AVLS, etc.) —** The Contractor could fax information on when snowplow truck mobilization has occurred when the MCI cannot be reached directly. E-mail and electronic data transfer may also be appropriate. The MCI can also log onto the Automated Vehicle Location System (AVLS) website to see where the trucks are at any given time, what they are doing, and when they went out; the MCI needs a computer and access to the internet for this.

The MCI may want to occasionally monitor the snowplowing operation during the night, especially when a significant winter storm is under way – without actually driving the roads each time. These methods help the MCI obtain a feel for how the Work is being performed.

c) **Snow & Ice Work Sheets —** The Contractor provides these electronic sheets via PMA to the MCI for payment; they are also a record of the Work accomplished.

5.1.3 SNOWPLOW TRUCK DISPATCH GUIDELINES

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

The Maintenance Contract Inspector and Contractor should discuss arrangements about dispatching the trucks in unusual circumstances. The MCI does not direct the Contractor's Work.

The Local Features section in the Request for Proposal (RFP) discusses local snow removal and ice control problems and hot spots. The MCI and the Contractor should be aware of these issues.

Usually, the Contractor will dispatch snowplow trucks when any of the following occur:
- good judgement and experience dictate
- winter driving conditions have deteriorated to a point where it is logical to dispatch them
- conditions match those set out in *Standard Specifications for Highway Maintenance*
- conditions match those set out in *Highway Maintenance Guidelines and Level of Service Manual*

The above mentioned documents outline some of the methods and guidelines the Contractor needs to follow to achieve *good winter driving conditions*. Good winter driving conditions are not always achievable in the desired time frame after non-typical winter storm events. The goal then is to achieve the best winter driving conditions under the circumstances. Due diligence is the key.

Other procedures that should be considered and discussed by the MCI and Contractor are the method and timing of:
- plowing/winging shoulders
- plowing approaches to residences, livestock, and active granaries
- plowing/sanding intersections
- sand/salt application rates
- when to use pre-wet units (including what may be outlined in the Contract)
- RWIS information and forecasts

Useful additional information may be found in the Contractor's *Operators' Training Modules on Snowplowing and Sanding* (which were originally developed by Alberta Transportation and the Contractors).

In cases of severe winter storms, it is sometimes necessary to bring in equipment from other areas (CMAs, Contracts) to fight the storm. Appendix E of the *Severe Winter Storm Task Group – Final Report* outlines a protocol on how to do this (as per Recommendation 5). In the event that additional equipment is required that is not usually used during average winter storms, see Appendix F of the same document for a protocol. See Appendix 4 to view the *Severe Winter Storm Task Group – Final Report*.

All highways need to be returned to good winter driving conditions in a reasonable time as per the terms of the Contract, and the Contractor needs to have sufficient staff to do so.

5.1.4 ICE CONTROL ON PAVED HIGHWAYS WITH ICE BLADES

Reference: Spec. 53.27 Maintenance and Preparation of Gravel Surface Roads and Snow Removal and Ice Control on Gravel and Paved Surfaces

Sometimes ice and packed snow builds up on a paved highway and cannot be easily removed by the snowplow truck. This build-up requires increased amounts of salt and sand to melt it. Under extremely cold conditions, sand and salt won't work well, but blading usually improves conditions.

Ice blades on a grader may be proposed to remove the packed snow and/or ice. These usually work reasonably well, although there is some risk that they may damage the pavement so they need to be used with great care, especially on chip seal coats. Generally, regular grader blades should be used. If a different blade is called for, use ice blades.

Graders equipped with Sandvik® tips are not usually recommended to remove ice from the highways. Experience shows that it is extremely difficult to avoid damaging the paved road surface. Rutting makes this problem worse. Do not use Sandvik® tips without considering the consequences.

NOTE: Sandvik® is a proprietary name.

5.1.5 PROTECTION OF SEAL COATS/CHIP SEALS DURING WINTER MAINTENANCE

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

When snowplowing on seal coats or on asphalt-stabilized base course surfaces (as identified by the Engineer), trucks need to be equipped with power floats, castor wheels, shoes, or rubber blades to reduce damage to these surfaces.

The use of other "protective equipment" will be subject to the approval of the Operations Manager. The Contractor is responsible for any damage done to these surfaces as a result of

snowplowing operations. Prior to the winter, the Contractor and Maintenance Contract Inspector should inspect the road and document the condition of the chip seal via pictures, video, and/or notes to file. The Chip Seal Contractor is responsible for defective Work during the warranty period.

The Contractor should be advised of these areas early in the summer so they can plan the proper location of Work, personnel, and suitable equipment, then reallocate and flag them as necessary for the following winter's Work.

Remember to check with the Regional Bridge Technologists, since they may also have seals on bridge decks that require protection.

5.1.6 DIRECTIONS TO CEASE SNOWPLOW OPERATIONS

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

The Contractor is expected to decide when it is appropriate to quit snowplowing. The MCI is not to direct the Contractor's Work. However, in unusual circumstances, the Maintenance Contract Inspector, in consultation with the Operations Manager, may want to cease snowplow operations earlier than the Contractor would because:

- the driving lanes are in good winter driving conditions
- darkness or low visibility prohibit clearing intersections, crossroads, or approaches safely
- shoulders are clear of significant snow accumulation
- there is low probability of drifting
- snowfall has stopped
- icy sections have been treated
- curves, hills, bridges, intersections, and railway tracks have been treated as required

Hours of service issues for the operators may lead the Contractor to de-escalate or temporarily suspend winter operations. According to the National Safety Code, operators are permitted to drive for 13 hours during a fifteen-hour work-day. An Hours of Service Exemption Permit can be obtained from Commercial Vehicle Enforcement to permit operators to drive for 15 hours during an eighteen-hour work-day. When the Hours of Service Exemption Permit is used, the Contractor is to advise the OM and ensure the proper documentation is completed (as per the requirement of the permit).

Hours of service issues have an impact on the Contractor's ability to provide 24-hour coverage in all Contract areas during extended and wide-spread storms. By law the Contractors are not to exceed the number of hours stated on their permit. Although Contractors are to have spare operators, they do not have a spare operator for every truck. During an extended winter storm some of the trucks will need to de-escalate until a fresh operator can be brought back to work after his break. In Contracts starting in or after August 2006, there is provision of Operator Availability (Additional Operators) requirements in the Special Provisions that will assist the Contractor with obtaining staff at key locations.

When the MCI thinks that the Contractor may be performing winter maintenance Work beyond that reasonably required for road, weather, and traffic conditions, the following steps should be followed:

a) **Monitor snowplow operations –** The MCI needs to ensure that the snow removal and ice control operations are being performed in the required manner. To judge this, sometimes it is necessary to observe the snowplows in operation during a storm, or check their status using AVLS.
   - The MCI should inform the OM if he believes that the Contractor is dispatching units when they are not required.
   - The MCI needs to discuss winter operations with the Contractor if he believes that the Contractor's staff should make corrections to the operating procedures. Disagreements on potential liability issues regarding ceasing operations needs to be resolved in a mutually satisfactory manner between the Contractor and the MCI. If they are unable to resolve the issues, then the managers will need to get involved.

   As the MCI monitors conditions, he might decide that the Contractor has done all that could reasonably be done to achieve the best winter driving conditions under the circumstances and according to the level of service guidelines. The MCI may believe that the snow removal and ice control operations should cease and should consult with the Contractor.

b) **Review operating procedures** – the MCI and the Contractor should review the winter maintenance guidelines to reach a shared understanding of what is expected and required:
   - before the winter season
   - on an on-going basis
   - in a post storm analysis after severe storm events
   - if there are concerns

   The operating guidelines are found in:
   - *Standard Specifications for Highway Maintenance*
   - *Special Provisions*
   - *Highway Maintenance Guidelines and Level of Service Manual*
   - the *Local Features* section of the RFP

   The Foremen and Operators need training, experience, and good judgment skills to make decisions based on present and anticipated road, weather, and traffic conditions that may not be clearly outlined in the winter maintenance reference literature.

   MCIs need sufficient training and experience to provide qualified judgments about when winter maintenance is not being performed as required. They also need to work with the Contractor to develop confidence in the judgment of the Contractor's staff. The Operators usually have experience dealing with local winter conditions.

c) **Discuss with the Contractor —** If the MCI believes that snow and ice removal should stop, he should contact the Contractor. The Contractor may have information that shows that local conditions are not representative of the whole area or that operations should continue to improve the level of safety for motorists. Information from RWIS (current conditions and forecasts) may help in providing a more complete picture.

It is important that the MCI clearly understands the combined road, weather, and traffic conditions before making a decision to shut down the snowplow operations. The MCI must review the situation with the OM prior to the action.

d) **Decide to cease operating —** The MCI has the authority to shut down winter maintenance operations if, after reviewing the situation with the Contractor, the MCI feels the Work is not needed. If this happens, then the Contractor may request to have this directive in writing for liability purposes. The MCI needs to give the order verbally to ensure a timely response, and then follow up with written notification. The MCI should not directly order the operators to stop, but should pass this instruction on to his counterpart with the Contractor, or another appropriate Contractor supervisor so they can de-escalate the crews as required.

e) **Review the decision to cease operating —** A decision to stop the operation of the snowplows will likely cause some controversy. MCIs must document the factors leading to the decision and review the effects of this decision in terms of the road conditions that followed.
- The MCI must review the decision with the OM.
- The Contractor may review the decision with Alberta Transportation staff so that they have a clear understanding of the criteria for ceasing snowplow operations. These criteria will be considered when there are similar situations in the future.
- The situation should be discussed at a post storm review.

5.1.7 SNOWPLOW HOUR METRES

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

Hour meter readings can be used to double-check the hours billed on the Snow & Ice Sheets.

If the MCI has concerns about the operational status of an hour meter, he should contact the Contractor to do either of the following:
- Confirm that the meters are all in working order
- Make an appointment to check a snowplow truck to determine that the hour meter is functional

If the hour meter isn't functioning or is not functioning properly, the MCI should request the Contractor fix it within a reasonable time frame. Although the hour meter isn't 100% accurate, it provides a reasonable check that the hours reported represent the hours worked. Alberta Transportation pays on hours worked, not on the hour meter readings. Not all of the hours recorded on the hour meter are billable hours to AT.

Contractors are required to provide equipment in good working order. It is good practice to ensure the hour meters are working as required.

Snow and Ice Control Sheet Audits
With the addition of Automated Vehicle Location Systems (AVLS), hour metre readings are no longer recorded on Snow and Ice Control Work Sheets. The times and segments are automatically recorded. The MCI can verify that the billable hours are reasonable by:

- ensuring the plows were working during or after a storm or wind event (to plow snow on the driving lane or shoulders) by checking AVLS for those days
- ensuring the truck ID and driver ID match those for his CMA/portion of the CMA
- reviewing the reasons an unknown segment is billable (if it pertains to a Snow and Ice Control Work Sheet)

5.1.8 SPREAD-CONTROL DEVICES

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

There are several methods to confirm the use of the spread-control devices.

a) **Check calibration records –** There is a process used to calibrate spread-control devices. It is recorded by the Contractor and reviewed by the Department.

b) **Field-check operational snowplows –** The MCI can observe the use of the spread-control device in an operating snowplow if he makes arrangements with the Contractor to do so. The proper application rate depends on present and anticipated road, weather, and traffic conditions. The experience and judgment of both the Operator and the Foreman are key in deciding the application rate and the effectiveness of the application being considered. The Foreman and Operator should check to make sure the appropriate application rate is being used and adjust accordingly.

   Information on the recommended application rates can be found in the *Maintenance Guidelines and Level of Service Manual* and other sources.

c) **View spread-control records –** Each spread control device that meets the requirements of *Spec. 52.1.3.8, Spread Control Device*, has the ability to perform data logging. The MCI can contact the Contractor to review the data logging records.

d) **Pre-Wetting** – This is an additional tool for the Contractor to use for snow and ice control. The number of pre-wet units required per CMA is outlined in the Special Provisions. The pre-wet system shall be integrated with the spread control device and automatically increase, decrease, start, and stop flow to match spreader activity. See *Spec. 52.9, Pre-Wetting Systems* regarding quality assurance testing and calibration. The Contractor is to keep pre-wetting records, and the MCI can review these records. See Appendix 15 for pre-wetting and anti-icing forms.

e) **Snow & Ice Control Work Sheets with information from AVLS** – these sheets provide information on the amount of sand and salt applied to the highway. These numbers were derived from the spinner application rate and the inputted ratio of sand to salt. AVLS also records the status of applying pre-wet (sprayer on or off).

   The spread control records provide a good starting point for discussing application of snow and ice control materials and optimizing the usage of these materials.

5.1.9 SNOWPLOW TRUCK AVAILABILITY

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

Provision of Snowplows within Availability Period

The Maintenance Contract Inspector and Contractor need to verify that snowplow trucks are available to perform snow removal and ice control Work during the availability period identified in the Special Provisions.

Contractors need to communicate with the MCI about the availability of their plows. The plows do not need to be sitting in the shop waiting to be called. They can be out performing other Work. However, there should be a viable plan to retrieve snowplows and operators in a timely fashion as per Contract specifications.

Contractors are encouraged to seek other Work when the trucks are not reasonably required to Work for Alberta Transportation. Contractors generally choose to use the Availability Rate to cover many of the fixed costs for these snowplows (including such items as mobilization/demobilization, depreciation, insurance, registration, lease costs, provision of loaders, etc). The Contractors want to maximize the availability paid to them to cover these fixed costs.

The MCI and the Contractor need to discuss criteria for when the truck can be considered available or not, as outlined in Spec. 52.1.7. During the availability period, the Contract requires that 2/3 of the specified trucks need to be at the shop and ready to work within one hour, and the other one third need to be available and at the shop within two hours, so that they are ready to plow or sand as required. If all highways within a Contract Maintenance Area are in Poor Winter driving condition then 90% of the trucks for which the Contractor is being paid Snowplow Availability will be mobilized.

If the full complement of plow trucks is not available, the Department needs to be assured that the area is covered properly. Also, for each day a plow truck is not available (and there is no spare replacing it), Snowplow Availability should be reduced by the daily unit price.

Some of the factors that need to be considered are:

- expected weather conditions
- numbers of trucks available in neighboring CMAs (but still within the Contract)
- distance of truck from home shop
- spare trucks
- additional and spare operators
- previous Contractor response times
- truck maintenance requirements
- Contractor's non-AT workload

The MCI has several methods of confirming whether a Contractor's truck is available. These include:

a) **Notes on Snow and Ice Control Work Sheets —** The MCI may request that the Contractor note on the Snow and Ice Control Work Sheet when a unit has been substituted because another unit is out of service, if the substitute is not equipped with AVLS and a manual Snow and Ice Control Work Sheet is used. If it is equipped with AVLS, the unit's number is automatically programmed into the system.

b) **Availability Sheet —** The MCI may work with the Contractor to develop a form (See Appendix 16 for an example of an Availability Sheet – as per a Severe Winter Storm Committee recommendation) that indicates which days the unit was available and a schedule for providing this information.

c) **Lack of availability —** The MCI can work with the Contractor to develop a process to identify when units are not available, which would be provided to the MCI on an agreed upon schedule.

Provision of Snowplows Outside of Availability Period

The specifications identify that the Contractor shall make sufficient equipment and personnel available at the earliest possible time. The intent of this is the Contractor will mobilize and rig up as many trucks as soon as he can, given that the trucks may be doing other Work and may not be readily available for snow and ice control operations. Payment for travelling time for trucks from other shop areas that are supporting snow and ice control operations should be given consideration during these storm events outside of the prescribed availability period.

If the Department requests the Contractor to prepare for an upcoming storm outside of the Availability Period, Availability Rates will be paid for the available trucks and operators, regardless if they worked or not, until such time that is agreed that the storm has passed/will not happen, as per Spec. 52.1 7.1.

5.1.10 ADMINISTRATION OF SNOWPLOW OPERATORS' BREAKS

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

NOTE: Breaks should be taken while the unit is parked safely off the road or at the maintenance shop. Breaks are noted on the Snow & Ice Control Work Sheet (labeled Stop Time).

When snowplowing, there are several breaks that the Operators are expected to take, to ensure the Operator stays alert and to ensure the equipment remains safe to operate. The specifications note that some of these breaks are excluded from payment, while others are paid.

Unpaid breaks include:

- fuel breaks
- meal breaks
- repairs or servicing
- equipment calibration
- plow blade changes

Paid breaks include:

- **coffee breaks** – Each operator is allowed 2 fifteen-minute coffee breaks per shifts greater than 6 hours.
- **equipment checks –** Operators stop for a short period of time (a few minutes) to check lights, windows, and mirrors and to clean and/or adjust them as required to maintain safe working conditions for the snowplow. This time is also used to walk around the plow to observe other concerns that may affect the plow's safe operation.
- **traffic breaks –** The snowplow Operator is expected to pull over at reasonable intervals, typically every 5 to 8 km or where it is safe to do so, to allow traffic to pass by.
- **safety** – If visibility is severely limited and the snowplows have to stop on the highway and cannot return to the shop for safety reasons, they should be paid for that time. If the Operators and trucks are at the shop, they will only be paid for the actual Work done, up to the point where visibility and road conditions deteriorated.
- **record keeping** – AVLS will automatically record segments, times, and plow operations. However, the Operator may still want to record the segments worked, track material used, and the time spent on each segment.

AVLS will automatically track the breaks (plow not moving for more than 7.5 minutes). It is up to the Operator to label the breaks as billable or non-billable.

For Contracts subject to the new Standard Specifications for Highway Maintenance (Edition 5, March 2010) manual, payment is based on moving time only and any stop times >7.5 minutes are excluded from payment.

5.1.11 EMERGENCY RESPONSE CHECK FOR SNOWPLOW FLEET

Reference: Spec. 52.1 Snow Removal and Ice Control (Truck)

The Maintenance Contract Inspector needs to verify that the snowplow trucks can achieve the desired response time. A measured approach should be taken to correct any perceived deficiencies. The Contractor should be allowed a reasonable time to address the concern.

If the Contractor does not take appropriate and timely steps to address the concern, then contractual penalties may be considered.

5.1.12 QUALITY ASSURANCE DRILLS FOR SNOWPLOW FLEET RESPONSE

The quality assurance drill process is used to determine the Contractor's ability to mobilize his snowplow fleet in a timely manner. It may be used if there is a question as to the Contractor's ability to respond when required for snow removal and ice control. The drill is extremely disruptive to the Contractor's operation and the Department must cover the Contractor's costs for mobilizing for this test the first time it is run in a season. If the first test result is unsatisfactory, subsequent tests will not be covered by the Department.

If the Department is not satisfied with the Contractor's ability to mobilize their fleet, the situation should first be discussed at an Operations Meeting or through some other suitable method. If the situation continues, penalties may be applied.

These steps may be followed if the MCI has reason to believe the Contractor is not able to adequately mobilize his fleet:

a) **Documented instances of inadequate response —** The MCI has documented instances where the Contractor didn't:
   - provide adequate response in a reasonable time and this information has been communicated to the Contractor
   - take adequate measures to improve the response time
   - consistently inform the MCI when a significant number of trucks were not available

b) **Concern with response at different shops or repeatedly at the same shop —** The concerns about response time are more than an isolated occurrence within a Contract Maintenance Area.

c) **Approval of the Operations Manager —** The Department OM has reviewed the incidents and agrees that a quality assurance drill would be an appropriate measure to check response.

d) **Expectation for snow removal and ice control —**The quality assurance drill may be conducted when snow removal and ice control Work will not be required on the designated day of the quality assurance drill (from information from weather forecasts or other relevant weather information). Contractors prefer that quality assurance drills be conducted when there is expectation of snow and ice control operations. This can be decided upon by discussion between the MCI and Foreman.

If the Contractor doesn't have an expectation of snow removal and ice control Work for that day in that area, he would likely allocate his trucks and crews to other Work and may have great difficulty responding in the required time frame. For this reason, advance notice to the Contractor is required.

e) **Notification of Contractor —** Once the OM approves the quality assurance drill, the Contractor should be notified, in a reasonable timeframe that the drill will occur.

5.1.13 DETERMINING SAND/SALT QUANTITIES

Reference: Spec. 52.7 Supply and Stockpile Sand
Reference: Spec. 52.8 Supply of Sodium Chloride (Salt)

The Maintenance Contract Inspector and Contractor need to measure the quantities of sand/salt remaining after each winter season and determine the requirements for additional sand/salt for the upcoming winter season by any of the following methods:

a) **Sand/salt stockpile measurements** — The MCI or FST and the Contractor measure the stockpile to determine the quantity remaining at the Department's fiscal year end for Department reporting/auditing purposes. Logistics dictates that all piles cannot be measured/estimated and calculated in one day. So according to the April 24, 2009 OPMC Minutes, sand/salt stockpile measurements can be done by March 24 to facilitate end of fiscal year reporting. If the quantity needs to be converted into tonnes, it is necessary to have an accurate conversion figure for the amount and proportion of sand and salt (tonnes in a cubic metre (t/m^3)). This can be done by weighing a known volume of sand and salt. This is also important if the Contractor is selling freeze-proofed sand/salt to other clients. Using the Contract specified conversion rates for sand density alone can lead to errors for the estimate remaining; the salt needs to be considered.

b) **Sand/salt usage** — The Snow & Ice Control Work Sheets from AVLS provide records of the estimated amount of sand and salt used. Subtracting the quantity used from the quantity originally stockpiled should provide an estimate of the quantity remaining. It is important to consider the equipment that the Contractor is using when trying to obtain accurate estimates. If using this method, confirm that the Work Sheet volumes are reasonably accurate. (e.g., verify that the spread control calibrations are accurate and the correct sand-salt ratio setting is used)

c) **Estimate of stockpile size** — Maintenance personnel can often judge the size of a stockpile in their shop or area with a moderate degree of accuracy due to their experience with the stockpile. This method should not be used for official records.

The *Severe Winter Storm Task Group – Final Report* outlines a Protocol for Winter Readiness – Sand and Salt (Recommendation 1). See Appendix 4 for a copy of this Final Report. Alberta Transportation has since outlined the time-line requirements for completing sand and salt work orders, and are outlined in each CMA's Special Provisions.

5.1.14 MONITORING SAND/SALT QUANTITIES

As an on-going task, the Maintenance Contract Inspector and Contractor need to evaluate the sand/salt usage over the course of a season to try to determine whether the usage was reasonable for the road, weather, and traffic conditions. The MCI and Contractor will get the best overview of this by working closely throughout the winter on snow removal and ice control and appropriate application rates. At the end of the winter season, reported quantities should be compared to actual measured stockpiled quantities from the beginning and end of the winter season. If the quantities do not match reasonably closely, the MCI should review the material reporting procedures with the Contractor.

PMA has post storm review reports that can be used as tools for discussion for optimizing sand/salt usage.

Sand/salt designated or sold to a third party can be stored in the Contractor's shed. It can be in a separate pile to make the record keeping easy, or part of the same pile if proper records are kept. In some areas of the province, it is difficult to obtain sand/salt, and the Department may request that the Contractor does not sell any of sand put up for the Department to third parties without Department authorizations. However, if any sand/salt is sold to a third party by the Contractor, it must be reported as a negative quantity on a Crew Work Sheet on a monthly basis, or as otherwise mutually agreed.

5.1.15 FREEZE-PROOFING SAND

Reference: ***Spec. 52.5*** ***Sodium Chloride Treated Sand***
Reference: ***Spec. 52.6*** ***Calcium Chloride Treated Sand***

The Maintenance Contract Inspector and Contractor need to work together to determine the required quantity of salt or other freeze proofing agents to add to the sand.

Salt in the stockpile has the following purposes:

- to keep the stockpile from freezing and prevent the formation of large blocks of material
- to provide a small amount of de-icing chemical along with the abrasive sand spread on the pavement

The MCI and the Contractor need to review that:

- the correct amount of salt has been used to keep the previously unmixed sand in the stockpile from freezing (based on the area it is used in and the sand's moisture content)
- the correct additional amount (percentage) of salt has been added to the freeze proofed stockpile remaining from the previous winter
- the stockpile is not pickled too late in the season because the salt needs time to mix with the moisture in the sand to form a brine. The brine reduces the freezing point of the water in the stockpile, therefore minimizing the extent that the stockpile freezes.

Other chemicals (from the Department's Approved Products List) may be used (e.g., liquid calcium chloride, proprietary substances, etc.) to keep the pile from freezing.

Alternate chemicals are currently being developed and tested. These may be less harmful to the environment and less corrosive to concrete and steel. MCIs should monitor these developments and encourage testing within their areas.

5.1.16 REVIEW OF SAND SPECIFICATIONS

Reference: Spec. 52.7 Supply and Stockpile Sand

The Contractor shall provide sand meeting the Contract specifications or their Special Provisions. The two most significant factors on whether the sand material is acceptable are:

- performance on the highway under prevailing road, weather, and traffic conditions. If it provides significant improvements in friction for most conditions, it is probably acceptable.
- top sizes for the sand material that exceeds the specified top size will cause increased problems with windshield claims. Therefore, it is generally undesirable to approve sand material that exceeds the top size.

For all sand sources, the Maintenance Contract Inspector will request gradation test results for the material. Sand materials that do not meet the specified gradation must be reviewed and approved by the Operations Manager before it is used. Out of specification sanding materials are subject to a price adjustment, as outlined in Maintenance Bulletin 8 – Unit Price Adjustment for Out-of-Spec Sand.
http://www.transportation.alberta.ca/3348.htm

The MCI and Contractor should also provide an evaluation of the material's suitability for its intended purpose to the OM. Before making any recommendations on different sanding materials, the MCI and Contractor need to consider the cost of the various alternatives.

Alberta Transportation's current sand gradation specs are shown in the following tables. The Special Provisions for each CMA will identify which Class (5 mm, 8 mm or 10 mm) shall be used.

10 mm Sand Specification

Sieve	% Passing
10000	100
5000	75-100
1250	0-65
315	0-30
160	0-18
80	0-10

- Plasticity Index (PI) – NP-6
- No tolerance will be allowed on the top size

8 mm Sand Specification

Sieve	% Passing
8000	100
5000	75-100
1250	0-65
315	0-30
160	0-18
80	0-10

- Plasticity Index (PI) – NP-6
- A 3% tolerance will be allowed on the top size
- All material must pass the 10000 sieve

5 mm Sand Specification

Sieve	% Passing
5000	100
1250	0-75
315	0-30
160	0-18
80	0-10

- Plasticity Index (PI) – NP-6
- A 3% tolerance will be allowed on the top size
- All material must pass the 8000 sieve

See Maintenance Bulletin 8 or the Standard Specifications for Highway Maintenance (Edition 5, March 2010) manual on how to calculate adjustments for sand that does not meet the specifications.

5.1.17 SAND MIXING – SAMPLING

Reference: Spec. 52.7 Supply and Stockpile Sand

Quality Control of the sand is the responsibility of the Contractor. The Department may perform additional tests as part of their Quality Audit process. A sampling test and a sieve analysis test are outlined in *Spec. 55.3 – Aggregate Production and Stockpiling*, in the *Standard Specifications for Highway Maintenance*.

5.1.18 GRAVEL ROAD WINTER MAINTENANCE

Reference: 53.27 ***Maintenance and Preparation of Gravel Surface Roads and Snow Removal and Ice Control on Gravel and Paved Surfaces***

Plowing gravel surface roadways should commence before snow accumulations reach 10-15 cm on the roadway. However, if drifting conditions prevail, plowing operations may be commenced sooner. In general, gravel road winter maintenance schedules are determined by weather conditions and traffic volumes.

Priority should be given to school bus routes and higher traffic volume routes. Overall, priorities should be determined using local information.

During the first snow fall, it is desirable to mix snow into the loose gravel to stabilize the surface material when it freezes. This minimizes future gravel loss from snow plowing.

Ice blading may become necessary if the roadway becomes slippery due to compacted snow or ice. Ice blading roughens the surface for improved traction. Care must be taken to minimize gravel loss. Ice blading can be done with a special ice blade on the grader or with a blade equipped with Sandvik® tips.

Winging of snow into the ditch may be necessary before accumulated snow causes drifting or other operational issues. A guideline of when to wing the shoulders is a ridge depth of 30 cm along the shoulder edge.

Chips may be applied to gravel roads with ice build up to improve friction. Salt or de-icing chemicals should never be applied to gravel roads as it can work it's way into the base and weaken it, as well as promote potholes in the ice packed onto the road.

Gravel roadways must be returned to good winter driving conditions as determined by the Engineer in consultation with the Contractor.

5.2 SURFACE MAINTENANCE

All highway surfaces must be kept in a condition suitable for safe travel at the posted speed limit in typical conditions. Keeping the surface of all roads in a safe condition is the number one priority maintenance item.

Regular inspections of all paved and gravel surfaces are to be carried out by the Maintenance Contractor, as per the specifications and the Special Provisions, and should be recorded on the Highway Work Identification Form (see Appendix 9 for an example). These inspections are to identify Work required within the highway right of way.

The MCI will also perform quality assurance audits of the Contractor's inspection reports, as well as look for other possible hazards or issues.

Breaks or defects on the pavement's surface can pose a hazard to traffic; these areas must be identified and attended to immediately as per *Spec. 53.39, Highway Maintenance Work.* Until the necessary repair Work is done, warning signs must be placed on each side of the affected area. The hazard must be monitored until repaired.

Transverse and longitudinal cracking, surface oxidation, general hairline cracking, rutting, and pavement segregation are examples of distresses which if left unattended, will eventually develop into more serious pavement failures. The MCI and the Contractor should work together to address the repair of these areas.

5.2.1 DISPOSAL OF EXCAVATION

Reference: Spec. 53.1 Excavation and Backfill

The Maintenance Contract Inspector and Contractor should discuss the expectations for the disposal of excavated material before starting the Work so the Contractor can make the necessary arrangements. There are two commonly-used disposal methods for excavated material:

a) **On-site** — This means a location near the excavation where the material can be dumped into a washout, erosion area, slope, etc., generally within the highway right-of-way. The appropriate location and final condition should be discussed by the Contractor and MCI and must be acceptable to the Department. The material should be leveled so that the surface is smooth and uniform. This means it should not have loose rocks, asphalt lumps, earth lumps, or other debris on the surface. It should blend to match the existing ground. It cannot contain any contaminated material that would cause environmental damage. Any on-site leveling would be done at the Contractor's cost. Topsoil may need to be stripped to accommodate disposal of material. In this case, the topsoil would have to be replaced and the area should be reseeded.

b) **Off-site** — The Contractor is responsible for disposal of the excavated material. The material would be hauled away to a borrow pit, gravel pit, etc.; the site has to be acceptable to the Department and proper authorization/approval is required as appropriate.

Once the material has been dumped at the decided-upon location, it may be necessary to do further Work to level the material. If this is the case, then the MCI and the Contractor should discuss the required final condition and the method of payment for the Work. Depending on the condition of the material, it may take time (possibly weeks) before the leveling can be properly completed because the material may need to dry before it is leveled.

NOTE: If the material is left in the right of way to dry, it must not pose a public safety hazard, even in its "temporary" condition.

5.2.2 MEASUREMENT OF EXCAVATION

Reference: Spec. 53.1 Excavation and Backfill

Measurement for excavating subgrade soil and/or granular material will be in cubic metres, based on the volume of excavated material in its original position (compacted volume, not loose volume in a pile).

5.2.3 CRACK SEALING MEASUREMENTS

Reference: Spec. 53.4 Asphalt Pavement Crack Sealing
Reference: Spec. 53.5 Asphalt Pavement Crack Routing and Sealing
Reference: Spec. 51.2.14.8 Measurement and Verification of Quantities for Payment

There are several different methods to determine crack lengths. The Maintenance Contract Inspector and the Contractor should discuss methods for determining the most appropriate method before the Work starts. Common methods are:

- **Full measurement –** This requires a worker and a measuring wheel to physically measure the length of each crack which has been crack sealed in the highway section. This is the most accurate method, but it is also the most time consuming and expensive method.

- **Random sampling –** This requires choosing a representative random sample section of highway within a given highway segment being crack sealed. The cracks are measured by a worker with a measuring wheel. The total number of cracks determined for the sample section is pro-rated for the highway segment crack sealed to determine the total length of cracks. This is usually done together by the Contractor and the Department.

  e.g., If there are 1,000 m of cracks in a 500 m sample section, then there are 10,000 m of cracks in a 5 km segment of highway crack sealed.

NOTE:

- The crack conditions in the sample section need to be representative of the entire highway segment crack sealed. The sample section also needs to be long enough to be representative.

- Sample sections should be 200 - 500 m long and include enough transverse cracks to be representative. With care, this method can achieve reasonably accurate results with reduced effort and costs for measuring the cracks. Additional sample sections may be taken, as necessary, if the density of transverse or longitudinal cracking changes in the highway segment. This would then be pro-rated to the length of highway they represent.

- **Modified random sampling –** Rather than measuring the length of every crack, it is possible to estimate the length of transverse and longitudinal cracks in a sample section.

  Transverse cracks are counted in the sample section, including partial cracks, and multiplied by the width of the highway. This is extremely effective when the majority of cracks are transverse cracks.

  Longitudinal cracks usually need to be measured. If there is a single longitudinal crack down the centre line within the sample section, the length can be estimated.

  The total length of cracks is then determined by pro-rating the length of cracks in the sample section versus the length of the highway segment that has been crack sealed.

  e.g., A 5 km segment of highway is crack sealed and it has been measured to have 4,900 m of longitudinal cracking. The road is 10 m wide and there are 51 transverse cracks in a 500 m sample section. Therefore, this 5 km of highway has 5100 m of transverse cracking. The total length of cracking in this 5 km segment is found by adding the longitudinal cracks and the transverse cracks (4,900 + 5,100 = 10,000 m).

  With Modified Random Sampling, ensure:
  - the sample section is representative of the highway segment being crack sealed
  - the sample section is long enough to be representative
  - a minimum of one sample section is done per surface condition segment

  Sample sections should be at least 200 - 500 m long and include enough transverse cracks to be representative. This method can achieve reasonably accurate results with reduced efforts and costs to measure the cracks. The number of sample sections used can vary to accurately reflect the changes in density of transverse or longitudinal cracking. The sample sections need to be representative of the average density of cracks on the segment. They can be pro-rated to the length of highway they represent.

- **Historical Information** — There may be historical information that identifies the length of cracks in a given highway segment. Where this is the case and it is believed that these numbers remain representative of the highway, the MCI and Contractor may agree to continue

to use these numbers for payment for the Work. Numbers may be adjusted to take into account new cracks that may have developed.

Timing of Measurements

- **Premeasure** – Cracks can be measured before the Work starts, and the quantities are agreed upon between the MCI and the Contractor.

  The advantages of premeasuring include accurate budgeting information, as well as accurate quantity information that can be provided to the Contractor prior to the Work. The disadvantages of doing this occur when there is a difference between cracks actually crack sealed and the cracks that either the Department or the Contractor expected to be crack sealed. Some reasons this might occur are due to cracks missed - say the longitudinal cracks - or that new cracks have formed since the last measurement.

- **Post measure** – Cracks are measured after the Work has been done.

  The advantage of post measuring is that there is no dispute of the crack sealing Work which has been done. The disadvantage of this is there may be some question as to where the actual end of the crack is after the cracks have been covered in crack sealing oil, and therefore whether the measurements accurately represent the Work done.

It is worthwhile to review the crack sealing Work as it is being done to ensure there are common expectations as to what needs to be done. In the event of a dispute, it is recommended that measurement be undertaken jointly by AT and the Contractor.

5.2.4 CRACK SEALING VS. CRACK FILLING

Reference: Spec. 53.4 Asphalt Pavement Crack Sealing

The intent of the crack sealing specification is to ensure that the crack is sealed. A crack does not need to be filled to the pavement surface to be considered sealed. After the cold pour/hot pour is applied to the crack, the crack will appear fully filled, particularly after it has been squeegeed. It is not uncommon for the material to sag or settle in the crack and not look filled after a period of time. However, the crack would still be considered sealed and the material applied properly.

It is unreasonable to have the Contractor wait until the material sets up and then re-apply a second coat to fill the crack; this process adds no benefit to the final product. Crack sealing is done to prevent water from penetrating the pavement structure and provides a coating that minimizes weathering and decreases breakdown caused by traffic use. Raveling of the leading edges of the crack as well as damage due to pavement flex may also be reduced.

If rain washes out freshly-placed crack sealant, this becomes a warranty item. It needs to be reviewed by the Maintenance Contract Inspector and Contractor to see if/how the Work should be redone.

5.2.5 CRACK WIDTH SPECIFICATIONS FOR CRACK SEALING

Reference: Spec. 53.4 Asphalt Pavement Crack Sealing

The Maintenance Contract Inspector and the Contractor should evaluate the size of the cracks in the highway before starting the Work.

The specification says not to seal cracks less than 5 mm in width. With that in mind, a decision needs to be made on whether to crack seal areas that have cracks less than 5 mm, based on how many narrow cracks exist in the section to be measured. Cracks wider than 25 mm should be treated by another method. Decisions to crack seal cracks narrower than 5 mm should be based partially on the following:

- If the highway section is going to be crack sealed, then a decision is required on whether the narrow cracks should be sealed as well (do them all while you are there any way).
- If there is a relatively small proportion of narrow cracks, it is likely worthwhile to seal the narrow ones with the rest of the cracks.
- If the narrow cracks are in a clearly defined area that could be marked out in advance, it would be reasonable to request the Contractor not seal them.
- It is not reasonable for the Contractor to measure the width of the cracks while the crew is crack sealing and then try to determine which cracks should be sealed and not sealed as they are sealing.
- It is also unreasonable to expect that the crew would stop sealing a wider crack that narrows down to less than 5 mm in places.

5.2.6 SUITABILITY OF SPRAY PATCHING FOR SURFACE SEALING OR PATCHING

Reference: Spec. 53.7 Asphalt Pavement Surface and Crack Repair – Spray Patch

The Maintenance Contract Inspector should work with the Contractor to determine if spray patching is appropriate. It is a useful method for repairing segregated areas and other asphalt surface deterioration, such as wide cracks, alligator cracking, and shallow potholes.

While it will not fix underlying failures in the asphalt structure, sealing the surface will probably prolong the life of the pavement. This should be considered when determining the suitability of the method and the extent to which the warranty would apply.

Other options, such as surface patching, deep patching, using “hot mix” or “cold mix”, fogging, crack sealing, etc., may also be appropriate treatments, depending on the surface deterioration.

In some cases, multiple spray patch applications may provide adequate treatment, especially on lower-traffic-volume highways.

It is not generally a good idea to spray patch over cold mix.

***As a rule of thumb*:** when spray patching, the patch should be 1.5 to 2.0 aggregate diameters deep (typically 10 - 13 mm deep) or the patch will not bind together well and will have an increased probability of wearing or peeling off quickly.

5.2.7 COMPACTION EQUIPMENT FOR SPRAY PATCHING

Reference: Spec. 53.7 Asphalt Pavement Surface and Crack Repair – Spray Patch

Compaction of a repaired crack or defective area will only be required when specified in the Work Order. When compaction is specified in the Work Order, a supplemental payment for the equipment required will be made as Extra Work in accordance with Specification 51.2.28, General (for Maintenance Work).

5.2.8 POTHOLE MEASUREMENTS

Reference: Spec. 53.10 Asphalt Pavement Pothole Patching

The Maintenance Contract Inspector needs to work with the Contractor to determine methods for counting and measuring potholes.

Payment for pothole repair is by the kilogram of material used (not number of potholes). Payment options include:

- Paying by actual amount of material used (pay for 1 tonne and use it until it runs out)
- measuring the number of potholes and use an equivalent number of potholes per tonne for asphalt mix (approximately 79 potholes per tonne).

Potholes that pose an immediate threat to the traveling public are to be fixed as an immediate reactionary item, as per Spec. 53.39.4.3.

5.2.9 ACP MIX AVAILABILITY

Reference: Spec. 53.11 Production of Asphalt Concrete Pavement Material
Reference: Spec. 53.13 Asphalt Pavement – Surface Patching
Reference: Spec. 53.14 Asphalt Pavement – Deep Patching

Some Contractors do not have asphalt plants for maintenance, or the asphalt plants are located in places where they cannot reasonably be used economically for patching the entire contract area. The costs of moving a portable asphalt plant and setting it up are extremely high for small volumes of mix.

Therefore, much of the ACP mix will be purchased from other sources. Typically, when the material is required for patching, the Contractor is not the only party obtaining mix, so the Contractor must take what is available from the plant at that time. An asphalt plant cannot readily change the mix type in the middle of a production run.

A Maintenance Contract Inspector must keep this in mind and work with the Contractor if they believe there is a need to obtain a mix different from the one that is readily available. AT should also be aware that there may be a significant premium to obtain an alternative mix, if it can be made available at all.

If the desired mix is not readily available, there are options:

- reduce the price for a readily available mix
- adjust or waive the warranty to reflect the difference in material
- change the time frame of the Work until the desired mix is available
- accept other mix designs
- haul from a different plant

The Department reserves the right to pay haul distance from the nearest available source for equivalent material, regardless of where the Contractor gets the ACP.

5.2.10 DEEP PATCHES VS. SURFACE PATCHES

Reference: Spec. 53.13 Asphalt Pavement – Surface Patching
Reference: Spec. 53.14 Asphalt Pavement – Deep Patching

The Maintenance Contract Inspector should work with the Contractor to determine the appropriate method to repair a given pavement defect and to identify the appropriate quantities and locations of patching required.

If a pavement defect indicates a deeper base failure, (i.e., alligator cracking) a decision needs to be made on whether the defect will be excavated and repaired with a deep patch or whether it will be surface-patched. Generally, removal of failed asphalt and replacing with new asphalt does not constitute deep patching; deep patching requires repair to the subgrade.

In most cases, a surface patch will probably last for a couple of years or more. The deep patch may last longer (several years), but is much more expensive, so fewer patches can be completed in a year for the same budget dollars.

If the probability of failure is expected to be low, it makes sense to surface patch, as redoing a surface patch is generally not that costly relative to the cost of doing all repairs as deep patches. However, a subsequent deep patch in an area where several layers of surface patches were applied may constitute payment by Extra Work for removal of the excess asphalt.

If the MCI and the Contractor agree that the surface patching method may not survive the warranty period in all locations, then they can negotiate whether a warranty should be adjusted or waived.

5.2.11 PAVER PATCHING VS. MACHINE (GRADER) PATCHING

Reference: Spec. 53.13 Asphalt Pavement – Surface Patching
Reference: Spec. 53.14 Asphalt Pavement – Deep Patching

Paver patching is most appropriate for longer patch lengths (approximately a tandem truck load) so that the paver has enough time to adjust and smooth out surface roughness on high volume roads. The Maintenance Contract Inspector and the Contractor should discuss paver patches less than the quantity in a tandem truck load as there are practical limits as to what a paver can effectively do. Grader patching is generally not appropriate on roads that allow truck and trailer combinations known as Long Combination Vehicles (LCVs) unless extreme care is taken by the Contractor to make a smooth patch so that all wheels on the LCV remain stable; grader patching usually produces a rougher patch than a paver.

There still may be dips at the beginning or end of the Work area if the paver is expected to fill in large defects; raking may be required. Raking is also generally required to provide a smooth transition between patch and existing pavement.

Pavers are inefficient when:
- they have to do many small patches
- they have to do part loads per patch
- they are doing short, thin, full-width patches.

Pavers are advantageous because they:
- provide a smoother patch than grader patching with neater transitions at the ends
- tie into fixed highway features such as bridge approaches better than a grader patch
- work better for a long patch, rather than many closely-spaced small patches (since this will mean fewer transitions between the paver patch and the old pavement)
- allow more cost-effectiveness and efficiency on large patches because the Work can be done in one continuous operation rather than having to stop and start at the beginning and end of each patch. It also uses the material more effectively.

Grader or machine patching has its pros and cons:
- it is generally less expensive, but takes skill to make the Work smooth. The end transitions tend to be less neat than paver patches, although they can be done to a high standard.

- it is more cost effective for smaller patches.

NOTE: Patches that are located close to each other can be completed more economically than those that are widely spaced.

Paver patches 100 m or greater in length need to be reported by the MCI to the Road Surface Data Coordinator, Road Surfacing and Aggregates, Technical Standards Branch, in Edmonton for pavement management purposes.

5.2.12 EMERGENCY PATCHING VS. NON-EMERGENCY PATCHING

Reference: Spec. 53.13 Asphalt Pavement – Surface Patching

The Maintenance Contract Inspector may authorize "emergency patching" when it is necessary to provide a temporary patch on the highway to protect public safety. In this case, the temporary patch is not intended to be a final solution, but is good enough until a permanent solution can be implemented. When necessary to undertake "emergency patching", the Contractor shall complete the Work within 2 calendar days of the issuance of the Work Order.

For non-emergency patches, the Contractor shall complete the Work according to the approved Work Plan, typically by September 30. In more urgent situations, the Contractor shall complete the Work within 10 to 30 days of the issuance of the Work Order. A "Surface Patching Premium" is to be paid for a non-emergency patch that must be completed within 10 days of the issuance of the Work Order. A "Surface Patching Interim Premium" is to be paid for a non emergency patch that must be completed within 30 days of the issuance of the Work Order.

The Warranty period for "emergency patching" is 7 days. All other surface patching has a Warranty period of one year.

"Emergency patches" would generally be authorized under the following circumstances:

- **Winter repair –** Almost any patching in winter would be expected to be temporary because it is difficult for the Contractor to achieve adequate compaction, bonding with the existing pavement, or to properly excavate and backfill the failed area. Although winter weather varies across the Province and from year to year, temporary patching is most commonly used between October 1 and April 30.
- **Spring repairs/extended rainy weather –** Usually in spring, there is moisture in the thawing ground that can minimize the chances of obtaining a good base for the repair. Moisture in the base also causes problems during extended rainy weather, so a temporary repair may be required until "drying" weather occurs.
- **Mix availability –** Hot mix is not generally available in the winter and may not be available until late spring, depending on the asphalt plant. A pavement failure may need a temporary fix to repair the asphalt until a local asphalt plant begins operation so that a more permanent fix may be constructed.

- **Highway overlays/reconstruction –** Where a highway is scheduled for an overlay or reconstruction in the near future, a judgement is required whether it is best to temporarily or permanently fix the area or let the construction crew fix the problem. This should be reviewed with the Contractor and the Operations Manager.

5.2.12.1 PATCHING CREDITS: SINGLE PATCH VS MULTIPLE PATCHES

Reference Spec. 53.13 Asphalt Pavement – Surface Patching

For larger size patches or multiple patches in a concentrated area, a patching credit may apply. For Work Orders which require:

- a single patch be constructed with a quantity of material used greater than 25 t, a "Surface Patching Price Adjustment – Single Patch" would be applied
- an excess of 100 t of patching material within a specified Work area up to 3 km in length, a "Surface Patching Price Adjustment – 100 tonnes" would be applied

The credits are to be applied with respect to the way the Work was carried out, and not necessarily the way it was ordered. The Work Order needs to be written in the way that the Work is intended to be carried out by the Contractor. To avoid any disputes over the application of the credits, it is highly recommended that the Maintenance Contract Inspector discuss in advance with the Contractor what he has planned for patching and how he is going to issue the Work Order. The Contractor will be able at this point to provide input on how they intend to carry out the Work, and whether they believe the price adjustments are applicable.

5.2.13 PAINTED ROADWAY LINES

Reference: Spec. 53.20 Painted Roadway Lines

Both the Maintenance Contract Inspector and the Contractor should monitor this Work on a regular basis to ensure the Work is being done in accordance with the specification. If there are deficiencies, they should be discussed as soon as possible.

Ideally, any deficiencies will be immediately reported so that the line painting Subcontractor can be notified and address them before leaving the area. Refer to the specifications if there are deficiencies in the quantity or quality of Work; there could be penalties. Examples of deficiencies are not matching the skip lines, offset lines, overspray, and poor reflectivity.

It is the Contractor's responsibility to advise the MCI when the line painting Subcontractor is working in the area. The Contractor must provide reports of the application rates for paint and beads and which segments of line were painted so that the MCI is able to monitor the Work effectively.

Line painting should be coordinated with surface Work (e.g. surface patching, crack sealing, and spray patching). Highways with no scheduled surface Work can begin when weather and equipment availability allows.

The MCI verifies that the Contractor is properly sampling the paint and beads for quality assurance.

Sometimes there can be confusing line painting markings on the highway. Refer to the Highway Pavement Marking Guide to ensure they are correctly placed. (http://www.transportation.alberta.ca/Content/docType233/Production/pavemark.pdf)

When updating or correcting paint markings, sandblasting the old markings (or some other acceptable method) may be required, in a manner as directed by the Engineer.

Due to Environment Canada regulations, the Department is moving toward using mostly low volatile organic compound (VOC) paint; such as waterborne and low VOC alkyd. It is important to use low VOC paint as recommended by the manufacturer, especially in terms of temperature. Starting September 9, 2009, Environment Canada published the *Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations* – these regulations include the use of highway line paint (a type of "architectural coating"). These regulations regulate the level of VOCs allowed in highways paints. The maximum allowable VOC content is 450 grams/litre, and after September 9, 2012, the maximum allowable VOC content of 150 grams/litres between May 1 and October 15. More detailed and up-to-date information can be found at www.ec.gc.ca/nopp/voc.

The Department has identified line painting as a critical Work activity, making it very important that it gets done on time each year. Line painting is required to be complete by September 30, unless otherwise stated in the Work Order. Line painting needs to be incorporated in the Work Plan, with the earlier due dates for specific and critical areas identified. Line painting not done by September 30 is considered demeritable (1 demerit if the Work is not done; 2 demerits for incomplete Work that endangers the travelling public – defined as not painting any lines on a highway in a year).

5.2.14 NEW PAVEMENT MESSAGES VS. OLD PAVEMENT MESSAGES

Reference: Spec. 53.21 Painted Pavement Markings

There will be occasions where the pavement will have existing pavement messages that use different dimensions or words from the current standard. The MCI and the Contractor have the following options to deal with this situation:

a) **Perform sandblasting –** This option has the benefit of completely removing the existing message, but it is costly. Therefore, it should only be used where absolutely necessary. Generally, the existing message is still applicable, so it can remain.

Fog coats should be applied to the sandblasted areas.

If the pavement is new, sandblasting is not a good idea. It can cause the pavement to deteriorate quicker than normal.

If applying durable pavement markings, this method of removing old paint markings is advisable, as the new paint may not adhere to the old paint.

b) **Repaint over existing message with new stencil –** This option needs to be used with care. Generally, it is not advisable as it tends to create a poor visual appearance, unless the existing pavement message has almost worn off. If the message has to be left in this location, it can be made to look acceptable. (e.g., the points of the new and old arrow can be kept at the same spot.)

c) **Repaint in new location –** If a new stencil is going to be used, it may be painted in a new location and let the old pavement message wear out. However, this can become cluttered and confusing for motorists. Also, depending on how thick the paint is on the existing pavement message, it may take a number of years for it to wear off.

Judgment needs to be taken with this approach, as some messages need to be left at the current location, not moved.

5.2.15 SELECTING PAVEMENT MESSAGE WORK

Reference: Spec. 53.21 Painted Pavement Markings

Different style, size, and shape of pavement messages in the same intersection can be confusing for the travelling public. Therefore, it is preferable to repaint all the pavement messages at one intersection at one time, rather than piecemeal, unless there are other considerations such as some of the messages are still in good condition. Also, it is generally more efficient to have the Contractor paint more messages at one site, rather than fewer at many different sites.

If it can be scheduled, it is preferable to set up a program to repaint different intersections in different years.

Public safety will be the deciding factor. For example, the Maintenance Contract Inspector may choose to repaint all stop bars every year, but repaint the words every 2 – 3 years.

5.2.16 HIGHWAY MAINTENANCE WORK

Reference: Spec. 53.39 Highway Maintenance Work

The intent of Highway Maintenance Work is for the Contractor to identify Work within the highway right of way and winter driving conditions through several types of road inspections,

attend to emergencies (as outlined in the specifications), and perform certain Work activities that are not feasible to be separated out into bid items (sign straightening, sign washing, litter pickup in ditches).

Scheduled Road Inspections - Year Round (Day Time)

The Special Provisions set out how often a Contractor must inspect the highways and mobilize the appropriate emergency response. Stop and yield signs, along with other road hazards, are also checked, reported, and dealt with immediately. This inspection determines what Work needs to be done now, as well as how to plan effectively for future Work. It also provides an opportunity for the Contractor to inspect the roads to ensure that the Work has been undertaken with the appropriate degree of due diligence.

During the performance of road inspections, emergency duties, routine highway maintenance activities, or at any other time the Contractor's personnel are traveling 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 respond to emergency Work immediately and report other Work to the Engineer.

The Contractor is required to fill in a Highway Work Identification Report on a regular basis and submit it to the Engineer. Identified programmed Work, such as mowing, line painting, and programmed patches, is not generally listed during this process. See Appendix 9 for an example of a Highway Work Identification Report and some guidelines on filling out the report.

Scheduled Road Inspections – Winter (Night Time, for AMA Road Report)

These inspections are night time road inspections done for the purpose of obtaining a sample of the area's driving conditions and reporting those to the AMA Road Report. Some areas have only scheduled inspections, while others have a combination of scheduled and on-demand inspections. Check the Special Provisions in the Contract to find out what is specified for a particular Contract Maintenance Area. Most Operations Managers allow the Maintenance Contract Inspector to order on-demand inspections as required.

There may be local agreements about partial payment for scheduled road inspections that result in snowplow mobilization (and the rest of the patrol is not completed), or whether or not the Maintenance Contractor can initiate an on-demand inspection. The OM will know what the local agreements are.

As part of the Scheduled Road Inspection – Winter, the Contractor shall provide road condition updates to Alberta Motor Association (AMA Road Report) as per the Contract Special Provisions and the Severe Winter Storm Committee Recommendation:

- By a certain time each morning
- When conditions change
- Severe Winter Storm Committee Recommendation 10: If road conditions are reported as POOR in the morning AMA Road Report, a subsequent report should be sent at or before

1:00 pm. If the road conditions remain POOR, an additional report should be sent at or before 4:30 pm

The AMA Road Report is updated via the internet at www.abrr.ca. Each Contractor has a user name and password to access the website. It can be updated via desktop/laptop computer, tablet, or PDA (Blackberry-type device) that is connected to the internet.

The Department can access www.abrr.ca as well:

- to update the road report if need be
- and to access the road report updates to check on the status of their roads

The report shall be updated when required to ensure that the travelling public is kept current with changing roadway or weather conditions.

If the Contractor is not able to update the road conditions via the internet by any means, as a last resort they can call AMA directly at 780-989-6361 – quote the highway number, AMA ID number, and new condition.

In unusual conditions (floods, fires, etc.), "winter road inspections" may be ordered during warm weather to determine the condition of part or the entire highway network and is paid for by Additional Road Inspections.

For all road inspections, the Contractor's staff performing the inspection must have adequate training to accurately report highway conditions, recognize hazards, and initiate appropriate responses. They also must be trained on how to use the www.abrr.ca website.

Public complaints: MCIs often receive complaints from the traveling public. When this happens, the MCI should:

- listen carefully to find out what the complaint is about
- ask questions to find out as many details as possible
- if required forward the complaint to the Contractor or OM for action
- if requested, make a follow-up phone call a day or two later to let the person know what has been done about the complaint

In many cases, the Contractor handles the majority of the complaints and follow-up calls received on road maintenance. The Contractor needs to communicate with Alberta Transportation on the complaints and the action taken to solve the problem. This is done by the Contractor providing the Department with their monthly phone log.

It is not appropriate for either AT staff or the Contractor to ignore a complaint. It is not appropriate to pass a complaint on to someone else, unless that person is better qualified to answer the concern. It is not appropriate for either AT staff or the Contractor to pass blame onto one another when talking to the public.

5.3 ROADSIDE MAINTENANCE

5.3.1 HAND TRIMMING

Reference: Spec. 54.1 Mowing and Hand Trimming

In the specifications, hand trimming is considered incidental to the Work. However, the Maintenance Contract Inspector should talk to the Contractor to clarify the Department's expectations on the amount of hand trimming to be done in each round of mowing.

Hand trimming around highway features is defined for items such as guideposts, signposts, guardrail, culvert ends, and utility pedestals.

Areas with steep slopes (which are unsuitable for the use of mowers) requiring hand trimming to bring the vegetation below the level of the road surface, should be compensated for by payment of *Supply of Labour for Miscellaneous Work* and *Supply of Truck for Miscellaneous Work*.

5.3.2 CHEMICAL VEGETATION CONTROL

Reference: Spec. 54.4 Chemical Vegetation Control

The Maintenance Contract Inspector and Contractor should have good communication with the local municipality's Agricultural (Ag) Fieldman.

The issue of weed control is politically sensitive. The Department has a desire to achieve the highest level of weed control, consistent with the budget and sound weed control practices.

The Ag Fieldman is a good resource regarding the use of different types of chemicals, proper application rates, etc., and can suggest various reference materials on weed control that would be useful to the MCI. Due to the high cost of chemicals, the most cost effective chemical should be requested. Decisions need to be made as to whether you are trying to control the weed propagation or kill the weeds completely.

It is the Contractor's responsibility to advise the MCI where and when spraying is taking place.

Some individuals have requested a no-spray zone adjacent to their property. Each one of these individuals is required to fill in an application on an annual basis. The application form is attached in Appendix 5.

See Section 2 on Weed Spraying for more information.

5.3.3 CULVERT DEBRIS

Reference: Spec. 54.6 Cleaning Debris from Culverts
Reference: Spec. 53.39 Highway Maintenance Work

When cleaning culvert debris by hand, the following criteria should apply in most situations:

- If only manual labour and hand tools are required to remove minor culvert debris, then this would generally be considered Highway Maintenance Work. A typical timeframe would be about 10 minutes of dedicated effort per culvert end.
- Cleaning debris left over or caused from highway construction projects would be considered Extra Work.
- If the amount of debris is significant and takes a long time to clean (exceeding 10 minutes of dedicated effort per culvert end), then the following options are reasonable:
  - pay for the Work by bid item
  - pay by Extra Work
  - negotiate with the Contractor if the above two options are not reasonable compensation

When using specialized equipment to clean culvert ends, the Work should be classified as Extra Work. A water truck and vacuum truck are not considered specialized equipment.

Rule of Thumb: If the Work can be performed by hand and within 10 minutes, it is considered as Highway Maintenance Work. If it takes longer to perform, it should be paid for under the bid item.

Refer to the Special Provisions regarding cleaning frequency and timing requirements.

5.3.4 DAMAGE TO GUIDEPOSTS

Reference: Spec. 54.19 Guide Posts

It is the Contractor's responsibility to take reasonable measures to protect the guideposts during **snow removal and ice control** Work. Where the Operations Manager (or Maintenance Contract Inspector) and the Contractor agree that reasonable measures have been taken, the damaged or lost guideposts would be repaired and paid for under this activity.

The MCI should recognize that some guideposts will be lost in the course of normal winter snowplow operations and that it is only when the guidepost losses become excessive that there should be cause for concern.

If the Contractor has not taken reasonable measures to protect the guideposts, such as lifting the grader blade wing and going around the guidepost when winging shoulders, then the Contractor would be liable to replace some or all of the damaged guideposts at his expense.

In order to confirm whether the guidepost losses are reasonable or unreasonable, the MCI should regularly inspect the highway network to determine if there are areas experiencing an unusual level of guidepost loss. If he observes this early enough, the MCI may be able to determine the reason for the loss and can discuss the protective measures that need to be taken by the Contractor and the reason that they failed in this particular instance.

There may be circumstances due to weather, road, or traffic conditions that minimize the Contractor's ability to protect the guideposts. Some mitigating factors are poor visibility, icy roads, snow and ice buildup around the delineator, deep drifts or buildup of snow along the shoulder, loss by other forces, etc.

If the MCI and the Contractor have regular discussions about the loss of guideposts throughout the winter (i.e., after each storm or on a monthly basis), they should not have difficulties determining who is responsible for replacing the guideposts at the end of the winter.

For **summer** Work, i.e. mowing, a similar philosophy would apply for the replacement of damaged guideposts. The Contractor is responsible for the replacement of all guideposts they damage during their summer operations. Guideposts knocked down by third parties will be paid for under the guidepost replacement bid item.

5.3.5 GUARDRAIL MEASUREMENT

Reference: Spec. 54.23 Supply and Installation, Realign or Reset W-Beam Guardrail and Posts

Reference: Spec. 54.24 Supply and Install Box Beam Guardrail and Posts

The specification indicates that the measurement for payment for guardrail will be in metres of the length of guardrail installed. For example, for measurement purposes, the standard w-beam guardrail system is considered to be 3.83 m (the bolt-to-bolt distance) multiplied by the number of sections of guardrail installed. Note there are other systems with different spacings (i.e., strong post, box beam, Thrie beam).

The length of guardrail being paid for cannot be longer than the guardrail in place (do not include overlaps). Measure from the centre of the post, and don't count the overlap where one section of rail overlaps another.

5.3.5.1 GUARDRAIL RESETTING

Reference: Spec. 54.23 Supply and Installation, Realign or Reset W-Beam Guardrail and Posts

If the existing rail is at the correct height and just the posts are replaced (in whole or in part), only the new posts should be paid for as "Supply and Place". New posts shall be installed at the correct

height. However it is acceptable to replace broken posts at existing height if only a small portion of the section is being repaired.

If only the height of the guardrail needs to be adjusted, and existing material is used, then "resetting post" would only be paid.

5.3.6 GUARDRAIL INSPECTIONS

Reference: Spec. 54.23 Supply and Installation, Realign or Reset W-Beam Guardrail and Posts

The Maintenance Contract Inspector and the Contractor should conduct regular inspections of the guardrail posts to determine the soundness of the posts. This can usually be done by one of the following methods:

- removing fill around the post to several centimetres below ground level and visually inspecting the guardrail post for rot
- tapping the post with a hammer to listen for signs of unsoundness (a "hollow sound" which can be determined through experience)
- splitting an occasional test post (that is already in the ground) to verify that the post is unsound

All new posts must be installed with a date stamp (with the date of installation, not the guardrail post purchase date). Only the year is required.

5.3.7 USE OF STRONGPOST W-BEAM GUARDRAIL SYSTEM

Reference: Spec. 54.23 Supply and Installation, Realign or Reset W-Beam Guardrail and Posts

In areas of unsuitable fill, steep side slopes, grade separations, or for highways with a traffic volume greater than 2500, the Maintenance Contract Inspector may request that the Contractor use 1.83 m posts (instead of the typical 1.52 m posts), spacer blocks, and a closer post spacing (1.9 metres).

See the Government of Alberta Roadside Design Guide for details:
http://www.transportation.alberta.ca/3451.htm
Table H3.4 provides information to help choose which barrier system is appropriate (see section H-3). The typical drawings are in Appendix B of that document.

5.3.8 STANDARD PROCEDURES FOR BRIDGE CLEANING/MAINTENANCE

Reference: Spec. 54.30 Bridge Structure Cleaning

Maintenance Contract Inspectors need to consult with the Regional Bridge Technologists and have an understanding of what is required on each bridge structure.

In the event of exceptional difficulties of obtaining local water supplies, i.e. extreme drought, consideration may be given to extra costs for haul of water or bridge washing may be reduced or cancelled for the year.

At time of printing, the manual entitled *Best Management Practices for Fish Habitat Issues Related to Minor Bridge Maintenance* was under review.
http://transportation.alberta.ca/2644.htm

5.3.9 WEAKENED SIGN POSTS IN THE RIGHT OF WAY

Wooden sign posts located in the clear zone, with dimensions greater that 100 mm X 100 mm must be modified to meet breakaway requirements. The link to Maintenance Bulletin 6 below outlines those requirements.

http://www.transportation.alberta.ca/Content/docType34/Production/maintenance_bulletin_6_-_weakened_wood_posts_08_22_08.pdf

It is intended that if weakened sign posts are knocked down during regular plowing operations because of thrown snow, the Contractor is not responsible for replacement costs. If the HMC is negligent during plowing operations and weakened posts are knocked down, the contractor will be responsible for replacement of those sign posts.

5.4 MISCELLANEOUS SPECIFICATIONS

5.4.1 BACKHAUL

Reference: Spec. 55.2 Hauling

There are situations where a Contractor may want to haul material to a central location to do the Work. Typically, this would apply to granular materials (gravel or sand) or cold mix, where the material could be stockpiled until required. These stockpile locations should be agreed to by the Contractor and the MCI and should generally address the needs of the CMA.

If the Contractor has hauled the material from a given material source to their shop and they must then haul it to a location between the source and the shop, it is generally reasonable to pay for the backhaul, given that the stockpile location was agreed to by both parties beforehand.

On small projects, it may not make economic sense for the Contractor to move and maintain a loader or other equipment at a given material source for extended periods of time.

On large projects, with sufficient material requirements, it may be reasonable for the Contractor to maintain a loader at the material source so that backhaul would not be required.

5.4.2 REPORTING BRIDGE PROBLEMS

Provincial bridge maintenance is the responsibility of the Regional Bridge Section. Should the Contractor or any Alberta Transportation staff member note needed repairs on a bridge in the Province, it should be reported to the RBT as soon as possible.

Items to look for include, but are not limited to, the following:

- loose planks
- loose bridge decks
- high load damage
- wide load damage
- loose or damaged deck joints
- accident damage
- bridge railings that need repair
- scour or erosion
- ice damage
- drift or debris problems

SECTION 6
BRIDGE MAINTENANCE ADMINISTRATION AND ACTIVITIES

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6.0 INTRODUCTION

6.0.1 GENERAL

In 1996, Alberta Transportation entered into a partnership with the existing Highway Maintenance Contractors to do minor bridge maintenance Work. Historically, department bridge crews did this Work. When the Work was outsourced, the department opted to extend the partnerships with the Contractors to include minor bridge maintenance Work.

The key players in this partnership are regional Alberta Transportation staff and the Contractors in each region. The objectives of the partnership are ensuring that the public can travel safely on Alberta's roads and bridges, while protecting the Province's investment in its bridge infrastructure system.

More discussion on the role and responsibilities of the minor bridge maintenance partners is found in *Section 6.6, Typical Minor Bridge Maintenance Activities*.

6.1 CONTRACT ADMINISTRATION

6.1.1 GENERAL

This section provides information relating to the administration and management of Alberta Transportation Contracts for primary highway minor bridge maintenance, extended under the Highway Maintenance Contract.

Because of the evolving nature of standards, guidelines, legislation, regulations, specifications, engineering, and construction practices, the guidelines outlined here are general. However, before Work begins, the Contractor must ensure that the legislation and the specifications for the Work are up-to-date.

The Contractor is responsible for using current standards and guidelines. AT monitors all aspects of the Contractor's Work.

6.1.2 RELATIONSHIPS

At the present time, highway and minor bridge maintenance activities are handled separately, using separate highway maintenance Work Orders and bridge maintenance Work Orders.

- For normal highway maintenance, the Maintenance Contract Inspector and Field Support Technologist liaise with the Contractor's highway maintenance representatives.
- For typical minor bridge maintenance, the Work is coordinated between the Bridge Technologist (BT) and the Contractor's bridge maintenance representatives.

To effectively administer both the highway and the bridge maintenance programs, the Regional staff must Work together to identify, prepare, and assist in the delivery of the Work.

There are occasions when the MCI might ask the BT that Work be carried out on a bridge structure in order to maintain efficiency. For example, when a highway maintenance crew is repairing approach guardrails, the MCI could request that the bridge guardrails be repaired at the same time. In this instance, a separate bridge Work Order would not be produced.

The opposite may also occur. While the bridge maintenance crew is repairing a bridge, the BT might ask that the crew carry out minor repairs to the damaged approach rails that would normally be repaired by the Highway Maintenance Contractor.

The Contractor, MCI, FST, and BT also share information (on such items as accident damage) that may trigger Work. This information usually comes through the following routes:

- when Contractor or department staff notice a problem or potential problem as they travel through the Region
- through public inquiries and complaints
- through regular inspections

Resources are also shared within this group. The MCI and FST have, on occasion, helped the BT to deliver Work such as bridge deck sealing, ACP, or chip coat overlays on bridge decks.

6.1.3 CONTRACTS – GENERAL

Highway Maintenance Contractors have signed a Memorandum of Endorsement accepting amendments to their existing Contracts and have ratified the changes to their existing Maintenance Contracts.

Bridge maintenance is part of the Highway Maintenance Contract between Alberta Transportation and the Contractor. All contractual and legal obligations contained within the original Highway Maintenance Contract are therefore extended to the typical minor bridge maintenance activities.

Other items in the Highway Maintenance Contract that also apply to the bridge maintenance activities include, but are not limited to, the following:

- change in the scope of Work
- time limits to complete Work
- Contractor personnel requirements
- Contract alterations or amendments

6.1.4 REFERENCE DOCUMENTS

The Bridge Technologist has several reference documents that are used to assist in the administration of the bridge maintenance activities. Some of these are listed below:

- Workplace Health and Safety Statute and Regulations
  - http://employment.alberta.ca/SFW/53.html
- Guidelines for Bridge Operations (GAP)
  - http://www.transportation.alberta.ca/3693.htm
- Specifications for Bridge Construction
  - http://www.transportation.alberta.ca/2653.htm
- Bridge Inspection Manual (BIM)
  - http://www.transportation.alberta.ca/2656.htm
- Alberta Transportation Policy Manuals
- Traffic Accommodation in Work Zone Manual
  - http://www.transportation.alberta.ca/597.htm
- Bridge Inventory System (BIS)
- Approved Product Lists (paints, concrete sealers, patching materials, etc.)
  - http://www.transportation.alberta.ca/689.htm
- Applicable Standard and Typical Bridge Drawings
  - http://www.transportation.alberta.ca/565.htm
- Bridge Materials Specifications

  - http://www.transportation.alberta.ca/565.htm
- ECO Plan (provided to the Department at the beginning of each year)
  - http://www.transportation.alberta.ca/571.htm
- Bridge Design Bulletins
  - http://www.transportation.alberta.ca/649.htm
- Alberta Roadbuilders and Heavy Construction Association (ARHCA) Equipment Rental Rates Guide
  - https://www.albertaroadbuilders.com/shop/default.aspx?CategoryID=18

NOTE: The current versions of the above specifications and documents would apply throughout the duration of the Contracts, or as otherwise reasonably negotiated between the partners.

6.1.5 HIERARCHY OF DOCUMENTS

This list is the hierarchy of documents used for Highway Maintenance Contracts. When there is a discrepancy between documents in a Contract, the following hierarchy of documents should be used, in descending order:

a) specific written instructions (on the Work Order)
b) specific plans, drawings, and/or sketches
c) Special Provisions
d) plans/drawings
e) general Specifications for bridge construction
f) technical Specifications for bridge construction

If there is a difference between scaled dimensions on plans and the figures written on them, 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.

6.2 REGIONAL BRIDGE SECTION

6.2.1 RESPONSIBILITIES

The Regional Bridge Group consists of a Regional Bridge Manager, Bridge Engineer(s), and Bridge Technologist(s), who deal with all aspects of bridge Work occurring within the Region, including, but not limited to:

- construction
- rehabilitation
- maintenance
- inspections
- special programs (i.e. ultra-sonic inspections, paint inspections, copper sulphate electrode (CSE) chloride testing, etc.)
- scheduling and programming

The following personnel are listed in the order that the Maintenance Contractor generally deals with each.

The Bridge Technologist has the most involvement in the day-to-day administration and delivery of the bridge maintenance Work. The BT deals with the Contractor's Bridge Superintendent (or representative) regarding all aspects of the Work.

The Regional Bridge Manager oversees the operation and administration of all bridge activities, and has final approval before any bridge Work is initiated.

The Bridge Project Engineer is usually involved in non-maintenance activities, but is a valuable resource providing engineering expertise.

The Regional Bridge Group deals with both bridges and culverts 1.5 m in diameter or larger (bridge sized culverts).

6.3 BRIDGE MAINTENANCE ADMINISTRATION

6.3.1 IDENTIFICATION OF THE WORK

There are several ways to identify necessary bridge maintenance. These include:

- **Personnel sources**
  - Regional bridge staff
  - Technical Standards staff
  - Maintenance Contract Inspectors
  - Field Support Technologists
  - Maintenance Contract personnel
  - construction personnel
- **Cyclic Inspection Services (inspections performed at a pre-specified time, from annually to a 39-month rotation)**
  - Level I Bridge Inspection and Maintenance (BIM) inspections
  - Level II BIM inspections
  - copper sulphate electrode (CSE) deck testing
  - chloride testing
  - ultra-sonic testing
  - timber coring
  - ***in situ*** concrete strength testing
  - deck sealant penetration testing
  - deck delamination testing
- **Other Sources**
  - general public
  - local land owners
  - other government agencies
  - the news media

6.3.2 WORK PLANNING

After the bridge maintenance Work has been identified, the BT, in consultation with the Regional Bridge Section and the Contractor, schedules the Work.

Ideally, the BT would have enough Work identified to allow the Contractor the flexibility to plan the delivery of the Work in a cost-effective and efficient manner.

Consideration would also be given to the following:

- weather constraints – (i.e., concrete Work that is normally done in summer would not typically be scheduled in winter)
- environmental constraints – (i.e., Work that may have an environmental impact may have to be completed within the specified window)

- irrigation constraints – (i.e., Work on irrigation canal bridges is often best done when the canals are not flowing, normally late fall through mid-spring)

Urgent or emergency Work is relayed to the Contractor by the BT as soon as it is identified. Immediate completion of this type of Work may often be required. Some examples of emergency bridge Work are:

- high load or wide load collisions
- overload damage
- hazards created by other types of accident damage
- loose or protruding deck joint plate
- severe deflection of culverts
- any item or condition on a bridge structure that presents a danger to the traveling public

6.3.3 INITIATING WORK

In order to initiate minor bridge maintenance Work, the Bridge Technologist (or someone from the Bridge Section) would produce a Bridge Maintenance Work Order. Different Regions may use slightly different names for this document (i.e., Bridge Maintenance Authorization (BMA)).

A sample Bridge Maintenance Work Order is included in Appendix 18.

Information usually provided by the BT on the Work Order includes:

- bridge file number (every bridge structure in Alberta has an identifying file number which is unique to that particular structure).
- job number (required for payment purposes)
- structure location
- structure type, including length, width, etc.
- environmental permits/licenses (if required, see Spec. 51.2.42)
- written instructions and sketches, any applicable details describing the Work to be done
- amount of time to complete (if applicable)
- supplemental information, such as engineering drawings, standard drawings, approved material lists, etc.

After receiving the Work Order, the Contractor submits a quote for the specified Work in a standard format (usually lump sum, unit price, or cost-plus).

The Regional Bridge Section then accepts, negotiates, or rejects the Contractor's price. If an agreement cannot be reached on Work plans, schedule, or price, the department reserves the right to put the Work out for tender. In exceptional cases, the department may offer the Work to another Contractor.

6.3.4 WORK PROCESS

After the Contractor is notified that the Work may proceed:

- The Contractor starts and completes the Work (while Alberta Transportation reviews and confirms that the Work meets the Specifications)
- The Contractor arranges for an acceptance inspection (final inspection)
- Alberta Transportation does the inspection and accepts the Work, or advises the Contractor of any deficiencies
- The Contractor invoices the Department for the completed Work Orders

6.3.5 CHANGE OF SCOPE

When it becomes apparent that the scope of Work or quantity of Work may change significantly, the Contractor needs to immediately notify the Bridge Technologist. After reviewing the potential changes with the Contractor, the BT will agree to one of the following:

- continue with the Work at the existing unit prices
- negotiate new unit prices or a revised lump sum cost
- discontinue the Work and make the structure safe. The Work may then be completed by separate contract or through another process.

6.3.6 WORK RECORDS

Work records are kept as a project progresses. The Contractor would normally be responsible for completing and updating most of the Work records, then forwarding these Work records to the Bridge Technologist at project completion.

Work records are eventually placed either on the bridge file or in a separate Work Order file.

Some examples of Work records are:

- technical data (i.e. concrete strength reports, pile data, surveys/profiles, etc.)
- pictures, sketches, or drawings
- health and safety summaries
- as-constructed drawings
- diaries (when required)

6.3.7 WARRANTY

The warranty period follows the Regional guidelines for the type of Work being ordered.

When the warranty is shown on the Work Order, the warranty period starts on the date that the Work received final acceptance.

6.3.8 QUALITY CONTROL / QUALITY ASSURANCE (QC / QA)

The Contractor is responsible for performing the quality control Work on bridge maintenance projects, as detailed in the Specifications for Bridge Construction. The Bridge Technologist must check that the Work is being done to a satisfactory quality standard (quality assurance). The BT can achieve this by:

- discussions of the QC/QA process with the Contractor
- on-site inspections
- review of Contractor's QC results
- review of manufacturer's QC results

Deficiencies identified during the course of Work are easier for the Contractor to remedy than those identified after the completion of Work.

On-site and final inspections are a vital part of the quality-assurance process. Random site visits are invaluable to ensure a high-quality product.

6.3.9 PERFORMANCE REVIEW

Since minor bridge maintenance Work is an extension of the Highway Maintenance Contract, the review process is the same.

6.4 SAFETY

6.4.1 HEALTH AND SAFETY

Alberta Transportation recognizes public and worker safety as priorities**.** It supports the joint efforts of management, employees, consultants, and contractors in providing a safe working environment for everyone involved.

- All Contractors must have accreditation/recognition or have enrolled in a safety certification program relevant to bridge maintenance and highway maintenance, as recognized by Alberta Labour, Occupational Health and Safety.

- Contractors who have not yet achieved accreditation in such a program must do so within six months of signing the Contract.

- The Contractor needs to ensure that his own work force and his Sub-Contractors or Owner-Operators have and follow a safety program and meet all OH&S requirements before starting minor bridge maintenance Work.

Many of the safety requirements that apply to highway maintenance also apply to bridge maintenance. See Section 1.4 of this manual on Safety.

6.4.2 RESPONSIBILITIES

The Regional Bridge Section should have the expertise to recognize and act on or avoid potentially dangerous situations that may threaten public safety.

While issuing Work Orders or inspecting the Work, the Bridge Technologist needs to:
- understand safety regulations and requirements
- recognize shortfalls in these areas
- take the appropriate action

The Contractor is responsible for safety on his site. However, the BT could request changes to procedures if he is concerned that safety for the workers or the public could be affected. If there is imminent danger, action may include stopping the Work. To accomplish this, the BT should have training and experience in safety measures as described in the following section.

6.4.3 SAFETY TRAINING

The Bridge Technologist should have some training in the following areas:
- first aid and CPR
- training on working alone

- OH&S Act and Regulations
- confined spaces
- trenching and excavating
- dangerous goods / hazardous waste
- traffic accommodation

Training is available through Alberta Transportation.

The BT should also have a good understanding of "reasonably practicable", a legal standard for the OH&S responsibilities of employers, contractors, and prime contractors.
http://employment.alberta.ca/SFW/53.html

The BT should also have a full understanding of the ***due diligence*** concept. See Section 1.4 of this manual for further information on the topic.

6.4.4 SPECIFIC BRIDGE SAFETY ACTIVITIES

Some of the activities where safety issues may specifically apply to bridge maintenance include:

- high rigging (working at heights), skeletal frames, scaffolding, man baskets, etc.
- crane safety and rigging
- working over water
- working in confined spaces
- trenches and excavations
- paint removal and collection of contaminants
- traffic routing and direction during maintenance; traffic accommodation strategies (e.g., flag people, portable traffic lights during lane closures)
- use of specialized hazardous material and disposal of hazardous waste

It is the Contractor's responsibility to ensure his workers are properly trained so that Work is completed safely.

6.4.5 SAFETY RECORDS

This is a partial list of safety-related records that the Contractor is expected to keep related to minor bridge maintenance Work:

Minutes and Reports	***Person/Partner Usually Responsible For Generating The Information***
safety meeting minutes	Contractor
worksite inspection reports	Contractor or RSO
accident/incident reports	Contractor
diary entries	Contractor, BT, FST, MCI, etc.
safety infractions and related written notice to the Contractor	RSO, BT

The Bridge Technologist should have access to, or may request to see, minutes from safety meetings or tail-gate meetings held by the Contractor whenever minor bridge maintenance Work is being performed.

The BT should receive the following reports so that he can monitor the events and ensure that corrections can be implemented, if necessary.

- copies of accident/incident reports when a problem occurs on the work-site. These reports should include third party damage or injury, personal injury, damage to public property, and significant damage to the Contractor's property
- any worksite inspection reports issued to the Contractor by either the Regional Safety Officer or an OH&S official

6.5 ENVIRONMENTAL REQUIREMENTS

6.5.1 ENVIRONMENTAL REQUIREMENTS

On January 1, 1999, Alberta Environment (AE) introduced the new Water Act. Covered under the Water Act is a document entitled "Code of Practice for Watercourse Crossings", which came into effect in April 1999 and was revised in April 2001.

http://www3.gov.ab.ca/env/water/Legislation/CoP/WatercourseGuide.pdf

This is an all-encompassing document for Contractors who conduct bridge and culvert activities involving in-stream Work. Contained within the *Code of Practice for Watercourse Crossings* is much of the information found on the previously used Environmental Permits and Licenses. Included are accepted Work practices and procedures, and "work windows" for in-stream activities for each area of the Province.

The Contractor will continue to submit his work proposal, plans, sketches, etc., to AE for review prior to starting the Work.

AE will be conducting random work site audits to ensure Contractors are complying with the Code of Practice.

It is important that Contractors work closely with AE throughout this process, and particularly during the initial transition period. It is also important that Contractors have a good understanding of both the new *Water Act* and the *Code of Practice*.

More information can be obtained from the Water section of Alberta Environment's web page.

http://www.environment.alberta.ca/3.html

The Contractor is also responsible for ensuring the Work is carried out in conformance with the Fisheries Act. http://laws.justice.gc.ca/PDF/Statute/F/F-14.pdf The Department of Fisheries of Oceans developed guidelines called Operational Statements that provide developers (including bridge and maintenance crews) with techniques that allow projects to proceed without affecting fish habitat and without requiring a Fishers Act authorization. These guidelines pertain only to federal requirements. Alberta Operational Statements can be found at:
http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territories-territoires/ab/index-eng.htm

6.5.2 HAZARDOUS MATERIAL TRAINING

The Contractor must comply with Provincial regulations and provide the appropriate training for his staff when:

- disposing of Hazardous Waste Material - (i.e., most paints, concrete sealers, wood preservatives)
- transporting Dangerous Goods - (includes such items as compressed gas, paints, paint thinners, and concrete sealers. The appropriate placarding of all vehicles involved is necessary).

http://www.tc.gc.ca/tdg/menu.htm

6.6 TYPICAL MINOR BRIDGE MAINTENANCE ACTIVITIES

6.6.1 LIST OF WORK

Typical minor bridge maintenance activities for bridges and culverts on the Provincial highway system may consist of the following:

Bridges

- joint repair (cover plates/seals)
- concrete patching
- concrete sealer application
- touch up painting
- galvanizing handrails
- collision damage repair
- resetting bearings
- corbel cap replacement
- stripdeck replacement
- sub-deck replacement
- backwall sheeting
- approach slab repairs
- retrofit drain installations
- temporary abutment and pier support
- repair/replacement of structural steel members
- repair of wheelguards
- repair of wing sheeting, piling
- replacement of pier caps
- repair of slope protection
- epoxy injections
- deck patching (epoxy polymers, silica fume, high early-high strength modified latex polymer patching, etc.)

Culverts

- strutting (steel/wood)
- installation or repair of collars, headwalls, cut-off walls
- installation of liners
- shot-crete repairs
- installation or repair of concrete floor
- culvert extensions

6.7 HIGHWAY OPERATIONS MAINTENANCE RESPONSIBILITIES

6.7.1 RESPONSIBILITIES

The following is a list of typical bridge maintenance items that are the responsibility of Operations staff and are normally carried out by Highway Maintenance Contractors.

- Monitor structures during the normal course of their road inspections and notify the Regional Bridge Manager or district Bridge Technologist of any problems or anything unusual at a bridge site (e.g., accident damage, deck joint problems, abnormal alignment, etc.)
- If there are any problems at a bridge site that are an immediate traffic safety concern, take immediate action to accommodate traffic and/or to alleviate the safety concern until the Regional Bridge Manager or his staff can assess and resolve the situation (e.g., barricade lane, remove debris from roadway surface, etc.)
- Supply, install, and maintain signing for bridge structures in accordance with current department standards, including the maintenance of reflectors and hazard markers on bridge rails.
- Wash accessible bridge components such as the decks, drains, curbs, railing, signs, abutments, piers, and the splash zones and bottom chords of trusses (de-icing salts should be removed as soon as practical in the spring). If there are questions about which components to wash, contact the Regional Bridge Manager or Bridge Technologist.
- Patch and crack seal ACP wearing surfaces.
- Minor repair of bank and head slope erosion and scour holes including replacement of rock rip rap.
- Maintain bridge drainage (trough drains at end of bridge, deck drains, etc.). Includes drainage of bridge approaches.
- Minor repair of timber strip decks.
- Remove minor drift, beaver dams, or other debris that may impede the flow at bridges and culverts.
- Minor repair of flexbeam railing (not posts).
- Repair or replace approach railing.
- Repair bumps at bridge approaches to reduce impact on structure (without damaging the structure).

Non-routine, more specialized maintenance activities may be carried out by the Highway Maintenance Contractor under direction of Regional bridge staff and funded through the bridge maintenance budget.

SECTION 7 PROGRAM MANAGEMENT APPLICATION PAGE

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7.0 INTRODUCTION TO PROGRAM MANAGEMENT APPLICATION (PMA)

7.0.1 AN OVERVIEW

Program Management Application (PMA) replaced Maintenance Contract Management System (MCMS) in April 2007. PMA was developed by Alberta Transportation for the following purposes:

- To provide an integrated, web-based system that will replace the three main stand-alone applications (CPMS, CIS, CSAM) and the various work-around systems (BPMS, CMS, and MCMS)
- To provide the keystone information for the department's construction, rehabilitation, and maintenance projects
- To provide all existing MCMS functionality in a web-based, integrated environment
- To provide some small enhancements that improve business processes, without impacting the Contractor's applications

Our main interest in PMA is as a replacement of MCMS.

PMA is a web-based program. Each Department user accesses PMA through TIMS with their login id (john.smith) and a password. The Contract and CMA/District/Region information is entered into PMA by the PMA Administrator in Edmonton. Department staff can do the following through PMA:

- create and maintain Work Orders
- create and maintain proposed Work lists
- create and maintain roadway segment data
- search for, print, and maintain Crew Work Sheets and Snow & Ice Control Work Sheets
- review worksheet batches, accept/return/reject worksheets and e-mail accept/return/reject reports
- create, find, and maintain progress estimates
- run the Timeliness Report to view the performance measure ratings
- run the Lateness Report to view the Work that was completed late on Work Orders
- enter and maintain budget allocations
- enter and maintain budget forecasts
- access other reports, such as the Post Storm Review report (as part of Recommendation 9 of the *Severe Winter Storm Task Group – Final Report*)

A new aspect of this system is that Contractors also have access to some parts of PMA. The Contractors can:

- propose work
- submit Crew Work Sheets and Snow and Ice Work Sheets
- review Work Orders
- maintain the list of Truck Operators

In future releases, Contractors may be able to have access to more aspects of PMA.

7.0.2 TRANSPORTATION INFRASTRUCTURE MANAGEMENT SYSTEM (TIMS)

In 1995, Alberta Transportation underwent a radical change in vision. The Department became a smaller organization, using innovative partnerships to provide alternative means of service delivery. Information Technology (IT) was recognized as a strategic component in the execution of the Department's business plan, and performance measures were identified to better manage accountability.

The need for a Transportation Infrastructure Management System (TIMS) emerged from this change in vision. This system is a business strategy employing people and technology to most effectively allocate limited funds among valid and competing needs. The scope of TIMS includes all highway infrastructure elements situated within the highway right-of-way boundaries. Examples of these elements are roads, bridges, interchanges, signs, guardrails, pavement markings, and vehicle inspection stations.

To achieve its business vision, the necessary features of TIMS include:

- an inventory capability to identify the infrastructure elements to be managed and where they are located
- an infrastructure condition component to record the physical condition of these elements at a given time
- predictive models to establish the remaining useful life of the infrastructure and to evaluate the impact of individual maintenance or rehabilitation treatments or combination of treatments
- a cost benefit module listing various treatments and combinations of treatments, related costs, applicability, and the likely effect on the useful life of the infrastructure elements being assessed
- a module to propose a program of intervention for each major infrastructure element based on available budget and other criteria, including technical, economic, or political issues
- a second level of optimization to allow valid competing programs to be prioritized, based on criteria important to the business

Alberta Transportation's business partners will have various roles and responsibilities in the evolution of the TIMS. These include collecting and entering data for the system, using the system in partnership with the Department, and helping develop new components as the system grows. These roles and responsibilities will evolve through discussions and mutual agreement in the months to come.

TIMS, as the Data Repository, has a direct link to PMA and its information. Inventory of all appurtenances and their condition are also contained in TIMS (collected, updated, and queried with Appurtenance Inventory Application – AIA). The data used by the Highway Pavement Management Application (HPMA) also resides in TIMS. The tools provided in HPMA assist Maintenance Contract Inspectors, Operations Engineers, and Operations Managers in budgeting and choosing treatment options for pavement surface maintenance. These tools will help manipulate the data in TIMS so that information can be provided in the manner required.

The ability to keep the inventory updated in TIMS also assists in preparing budgets and identifying needs for signs, guardrail, etc., by requesting reports of items grouped by condition.

7.0.3 USING PMA

For the most up-to-date information, follow the links below to the current training manuals.

What is TIMS?
http://www.transportation.alberta.ca/3605.htm

TIMS Support for Department Staff can be found at the following link:
http://aicm/Content/doctype28/production/index.htm
(click on the PMA balloon in the diagram)

PMA Training Manuals for Contractor Staff can be obtained through their Alberta Transportation colleague or direction through the TIMS Trainer (david.hadfield@gov.ab.ca).

Want to take a course in PMA? Contact the TIMS Trainer: david.hadfield@gov.ab.ca to find out about upcoming courses or to set up a course in your area.

See Appendix 7 for information on Budget Control and Forecasting in PMA.