



# **Procurement Guidance for Parking Lot Snow and Ice Management**

## **Version 1.1**

Prepared by:

Toronto and Region Conservation Authority

May 2014

Revised May 2015

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## **PUBLICATION INFORMATION**

Reports conducted under the Sustainable Technologies Evaluation Program (STEP) are available at [www.sustainabletechnologies.ca](http://www.sustainabletechnologies.ca). For more information about this project or the STEP program, please contact:

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## **THE SUSTAINABLE TECHNOLOGIES EVALUATION PROGRAM**

The Sustainable Technologies Evaluation Program (STEP) is a multi-agency program, led by the Toronto and Region Conservation Authority (TRCA). The program helps to provide the data and analytical tools necessary to support broader implementation of sustainable technologies and practices within a Canadian context. The main program objectives are to:

- monitor and evaluate clean water, air and energy technologies;
- assess barriers and opportunities to implementing technologies;
- develop tools, guidelines and policies, and
- promote broader use of effective technologies through research, education and advocacy.

Technologies evaluated under STEP are not limited to physical products or devices; they may also include preventative measures, alternative urban site designs, and other innovative practices that help create more sustainable and liveable communities.

## **ACKNOWLEDGEMENTS**

Financial support for this project was generously provided by the following organizations:

Toronto and Region Remedial Action Plan

The Region of Peel

York Region

The City of Toronto

The authors extend a special thank you to Robert Roszell for his invaluable advice and support.

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## **PART 1: INTRODUCTION**

### **Background**

In Canada, road salt is applied every winter in large quantities to roads, parking lots, and sidewalks with the aim of improving public safety and transportation efficiency. Each year, more than 5 million tonnes of road salt is used in Canada.<sup>1</sup> Road salt is the preferred chemical for winter maintenance activities because it is effective, relatively easy to transport and use, and low in cost. However, excessive use of road salt can cause adverse effects to the environment, drinking water supplies, and built infrastructure.

In 1995, a comprehensive five-year scientific assessment of the environmental impacts of road salt was conducted under the Canadian Environmental Protection Act, 1999. The final assessment report by Environment Canada (2001) concluded that the four most common forms of road salt were having an adverse impact on freshwater ecosystems, drinking water supplies, soil, vegetation and wildlife. To help Environment Canada develop a risk management protocol to address these environmental impacts, a multi-stakeholder working group was assembled with representatives from government, road authorities, the private sector, and environmental organizations to produce a *Code of Practice for the Environmental Management of Road Salts*, which was released in April 2004. To address salt management issues specific to parking lots and private property, Environment Canada also released *Best Management Practices for Salt Use on Private Roads, Parking Lots and Sidewalks* the same year.

### **Objectives**

This procurement guidance document for parking lot snow and ice management is intended to encourage the use of best practices for road salt management established by Environment Canada and other organizations such as the Transportation Association of Canada (TAC). The document is structured to remove incentives that can cause contractors to over-apply salts, and encourage the use of practices that reduce road salt use while ensuring parking lots and sidewalks are safe.

### **Reducing Over-application of Salt**

Parking lots are often subject to very high rates of road salt application. Several factors have been identified that cause contractors and ground maintenance crews to over-apply road salts. These include:

- a lack of clear guidance on appropriate salt application rates for parking lot surfaces;
- the desire among private business owners and contractors to minimize their legal exposure and risk from civil suits;
- cost considerations associated with the need for repeat applications within a 24 hour period;

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<sup>1</sup> Environment Canada. 2004. *Best Management Practices for Salt Use on Private Roads, Parking Lots and Sidewalks*, page 1.

- contracts that do not require high standards or allow contractors to charge based on the amount of salt being applied;
- outdated, ineffective and uncalibrated salt spreading equipment that does not allow the operator to effectively control the amount of salt being applied;
- the absence of documentation and data logging capabilities that result in higher insurance premiums because without detailed records most slip and fall suits must be settled out of court; and
- a lack of targeted training on the amount of salt to apply under different conditions, how equipment should be calibrated to ensure optimal performance, and the type and detail of records needed to minimize risk from slip and fall suits.

This procurement guidance document addresses these issues by introducing contract elements that promote the use of best practices for road salt application, drawing on advances in snow and ice control technology and industry practice. Based on a review of several winter maintenance contracts from municipalities and organizations across Southern Ontario, nine key areas have been identified that are likely to reduce road salt use while maintaining high levels of service and transportation safety.

### **Contract Pricing Structure**

Payment based on the reimbursement of costs or the amount of work accomplished (e.g. miles plowed or pounds of salt applied) does not encourage efficient and effective use of salt.<sup>2</sup> A pricing structure that creates a financial incentive for contractors to apply less salt is preferred. This may be a lump sum by season, a fixed sum per event with extra paid for standby costs, or some combination of these payment options (refer to Section 2.7 Basis of Payment).

### **Equipment and Calibration**

Research has clearly demonstrated that automated salt delivery systems that control application rates by vehicle ground speed can significantly reduce the amount of salt applied. In general, closed loop electronic controllers that measure both truck speed and spreader discharge rates have been found to outperform open loop controllers that measure truck speed only. In a study by Clear Roads, the use of closed loop electronic controllers resulted in salt savings of up to 47% when compared with manually controlled systems.<sup>3</sup> Regardless of the type of spreader being used, calibration is critical to ensure that the amount of salt targeted for application coincides closely with the actual amount of salt applied (refer to Section 7.7.4 Spreader Controls and Section 7.7.5 Calibration of Spreader Controls).

### **Application Practices**

The amount of road salt needed to keep parking lots clear of snow and ice can be significantly reduced by using anti-icing and pre-wetting application techniques. Pre-wetting involves coating dry road salt

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<sup>2</sup> VMS, Inc. 2001. Best Practices of Outsourcing Winter Maintenance Services.

<sup>3</sup> Blackburn, B. Fleege, E. and Amsler, D. Calibration Accuracy of Manual and Ground-Speed Controlled Salters, Clear Roads Project CR 2005-02, Wisconsin Department of Transportation, United States.

with a liquid before applying it to the pavement. This helps the salt stick to the surface of the parking lot and speeds the melting of the salt, which means less salt is needed to do the same amount of work. In a study of Ontario roadways, pre-wetted salt was more effective than dry salt in 5 of 7 cases, reducing between 17.9% and 40.0% more snow cover than dry salt.<sup>4</sup>

Anti-icing is the practice of applying a liquid (such as salt brine) or pre-wetted deicer to paved surfaces before the storm arrives. This prevents snow and ice from bonding to the pavement, making them much easier to remove. When compared to conventional deicing, anti-icing typically requires only ¼ of the material and can be done at 1/10 of the cost.<sup>5</sup> Anti-icing provides substantial cost savings to municipalities and road authorities because less salt is used, and to roadway users by reducing the number of accidents occurring in the winter season. On roads, anti-icing has been found to be effective at application rates as low as 100 pounds per lane-mile, which is equal to 1.57 pounds per 1,000 square feet<sup>6</sup> (refer to Section 7.9.1 Materials Spreading).

### **Materials**

A number of low chloride alternatives to road salt are currently available, such as acetates, formates, and organic products made from corn, sugar beets, and other plant materials. Road salt alternatives provide effective snow and ice control and many can be used as anti-icing or pre-wetting agents, delivering the same benefits as liquid salt brine without the use of chloride. In the Niagara Region, applying a beet juice compound as an anti-icing and pre-wetting agent to roads has reduced the amount of road salt on the roads by as much as 30%, while also lowering winter road maintenance costs.<sup>7</sup> In a field test of organic deicers performed in the Greater Toronto Area, a 30:70 mixture of beet juice and salt brine was found to be as effective as salt brine alone when used as a pre-wetting agent, and more effective (producing a higher coefficient of friction) than salt brine alone when used for direct liquid application.<sup>8</sup>

Standard road salts used for snow and ice control should also meet Ontario Provincial Standard Specifications (OPSS 2502) for moisture content, texture, and chemistry to ensure optimal performance (refer to Section 7.8 Materials).

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<sup>4</sup> Fu, L., Sooklall, R., and Perchanok, M.S. 2006. Effectiveness of Alternative Chemicals for Snow Removal on Highways. Transportation Research Record: Journal of the Transportation Research Board, No. 1948, Transportation Research Board of the National Academies, Washington, D.C., 2006, pp. 125–134.

<sup>5</sup> Minnesota Pollution Control Agency et al. 2010. Winter Parking Lot and Sidewalk Maintenance Manual.

<sup>6</sup> Blackburn, R. R., McGrane, E. J., Chappelow, C. C., Harwood, D. W. and Fleege, E. J., Development of Anti-icing Technology. Strategic Highway Research Program, National Research Council, Washington, D.C.1994.

<sup>7</sup> Niagra Region, <http://www.niagararegion.ca/living/roads/roadsaltreduction.aspx>. Accessed July 2013.

<sup>8</sup> Fu, L., Omer, R. and Jiang, C., Field Test of Organic Deicers as Prewetting and Anti-Icing Agents for Winter Road Maintenance, Transportation Research Board: Journal of the Transportation Research Board, Vol No. 2272, Washington, D.C., 2012, pp. 130-135.

## Application Rates

Knowledge about the amount of salt required to achieve a desired level of service under different weather and pavement conditions is needed to avoid over application of salts on parking lots and roads. In a study of winter maintenance practice in Central and Western Ontario, it was found that parking lot application rates were significantly higher than the road application rates developed by the Ministry of Transportation Ontario (MTO), with light application rates averaging between 10 and 15 pounds per 1,000 square feet.<sup>9</sup> Although parking lots may require heavier applications of salt because less traffic is present to disperse the salt applied, optimal application rates for parking lots have not been well studied. Scientifically defensible application rates for parking lots are being developed for Southern Ontario by the University of Waterloo through the *Snow and Ice Control for Parking Lots and Sidewalks* program ([www.SICOPS.ca](http://www.SICOPS.ca)) (refer to Section 7.9.2 Application Rates).

## Record Keeping

Surveys of snow and ice management contractors have consistently indicated that over application of road salts is closely linked to the fear and long term cost of potential slip-and-fall lawsuits.<sup>10</sup> Maintaining accurate and complete records of plowing and salting activities is the best form of defense against these lawsuits. These records may also reduce insurance rates as more and more slip-and-fall suits are successfully defended. Record keeping is also useful for monitoring the effectiveness of winter maintenance activities and identifying areas for improvement (refer to Section 7.10 Monitoring and Record Keeping).

## Decision-Making Tools

Making informed decisions about application methods and timing requires the use of supporting tools. Skillful use of local weather forecasts, road weather information systems, internet based radar systems, and infrared thermometers to determine pavement temperature trends can help make decisions that save on salt, time and money<sup>11</sup> (refer to Section 7.6 Decision-Making Tools).

## Contractor Training

Applying the right material in the right amount at the right time in the right place can only be achieved by a knowledgeable contractor. Developing this knowledge requires training and experience. Requesting evidence of this experience and requiring training and certification through the Ontario *Smart about Salt* Program will help to ensure that the contractor has the skills necessary to implement

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<sup>9</sup> Raqib, O., Mirtorabi, M., Liaqat, Z., and Fu, L. 2013. Monitoring and Analysis of Winter Maintenance Operations for Parking Lots. Paper prepared for publication & presentation at the 93th Annual Meeting of the Transportation Research Board, January 2014. Draft.

<sup>10</sup> Fu, L., Omer, R., and Liaqat, Z. 2013. A Survey of Current State of Practice for Winter Maintenance of Parking Lots and Sidewalks. Paper submitted for Presentation at 2013 Annual Transportation Research Board Meeting. Draft.

<sup>11</sup> Environment Canada. Case Study #7: Utilizing Technological Advances in the Management of Road Salt Usage in Nova Scotia. <http://www.ec.gc.ca/nopp/roadsalt/cStudies/pdfs/7%20-%20Nova%20Scotia%20-%2004%2005%2003.pdf>. Accessed August 2013.

best practices for road salt use. In the City of Toronto, the implementation of a road salt management training program for winter maintenance supervisors and operators reduced salt use by almost 37,000 tonnes over two winter seasons and saved nearly \$1.9 million dollars<sup>12</sup> (refer to Section 2.13 Contractor Training).

### Performance Measures

Performance measures (i.e. levels of service) in winter maintenance contracts can be divided into four general categories, as follows:<sup>13</sup>

- Inputs are the resources used for winter maintenance, and include labour and equipment hours, the weight of material applied, and the money spent using these resources.
- Outputs are the work performed, such as the lane-kilometers plowed or salted.
- Outcomes are a measure of how well the work was performed, and include the bareness of pavement, the time to achieve this bareness of pavement, and the friction of the surface.
- Value to the roadway user includes feelings of safety and comfort, ease of mobility, and access to desired travel routes.

Effective winter maintenance regimes use available inputs to produce outputs, which in turn produce outcomes, which ultimately result in value to the roadway user. Traditionally, winter maintenance contracts have used mainly input and output based performance measures. However, performance measures that incorporate outcomes are becoming increasingly common.<sup>14</sup> Outcome-based performance measures allow flexibility in the contractor's approach to meeting specified levels of service, and therefore may encourage contractors to develop more efficient, effective, and innovative snow and ice control practices. This procurement guidance document includes both output and outcome-based levels of service (refer to Section 7.4 Level of Service for Parking Facilities).

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<sup>12</sup> Environment Canada. Case Study #4: City of Toronto – Salt use Reductions through Employee Training. <http://www.ec.gc.ca/nopp/roadsalt/cStudies/pdfs/4%20-%20City%20of%20Toronto%20-%2004%2003%2026.pdf>. Accessed August 2013.

<sup>13</sup> VMS, Inc. 2001. Best Practices of Outsourcing Winter Maintenance Services.

<sup>14</sup> VMS, Inc. 2001. Best Practices of Outsourcing Winter Maintenance Services.

This procurement guidance document was developed by the Toronto and Region Conservation Authority (TRCA) based on wording from existing snow and ice maintenance contracts and request for tenders, as well as best practice guidance from the following sources:

Landscape Ontario. Snow and Ice Maintenance Contract between Owner and Contractor.

The Corporation of the City Of Woodstock. 2011. Tender for Winter Maintenance Services: Project #75010.

The Regional Municipality of Niagara. 2009. The Regional Municipality of Niagara Request For Tender for Winter Maintenance Water & Wastewater Facilities: Tender Number #2009-T-21.

Region of Waterloo. Section B Scope of Work: Generic for All Locations.

The Corporation of the Town of Richmond Hill. TW-42-09.

Environment Canada. 2004. Best Management Practices for Salt Use on Private Roads, Parking Lots and Sidewalks.

Minnesota Pollution Control Agency, Fortin Consulting, Inc., Circuit Training and Assistance Program, Minnetonka, University of Minnesota, Minnesota Department of Transportation, Scott, Minnesota Local Technical Assistance Program, Envirotech Services, Inc., Cadwell Lawn Care and Landscaping, General Growth Properties, Inc., and Mississippi Watershed Management Organization. 2010 Revised Edition. Winter Parking Lot and Sidewalk Maintenance Manual

Ontario Good Roads Association. Salt Management Plan Template.

Transportation Association of Canada. 2013. Syntheses of Best Practices for Road Salt Management: 9.0 Winter Maintenance Equipment and Technologies.

VMS, Inc. 2001. Best Practices of Outsourcing Winter Maintenance Services.

## **PART 2: SAMPLE REQUEST FOR TENDER**

**[Red, bolded text indicates instructions for use of the sample request for tender (RFT).]**

### **1 INTRODUCTION**

#### **1.1 Purpose**

The intent of this Request for Tender is to engage one or more Contractors to provide winter maintenance services for **[number of seasons]** winter seasons for **[name of municipality or organization]**, at the parking facilities shown on the Form of Tender, and as detailed herein.

#### **1.2 Description of the Company**

**[Provide a brief description of the municipality or organization that is requesting the Tender.]**

#### **1.3 Definitions**

**[Define the key terms used in the RFT.]**

### **2 SCOPE OF WORK**

#### **2.1 Duration of Contract**

The term of the Contract shall be from **[start date]** to **[end date]**, with an optional annual extension up to **[X]** years. The Contract duration is conditional upon Contractor performance, as outlined in Section 2.8, Performance Unsatisfactory.

#### **2.2 Maintenance Special Provisions**

The Contractor is responsible for completing the work, to at least the prescribed standard and within the required time or sooner, as identified in Section 7, Maintenance Special Provisions.

#### **2.3 Response Time**

Many maintenance activities, especially winter snow and ice control, have a direct impact on the safety of the travelling public. The Contractor is advised that the response time, both in identifying conditions during road patrol, and in mobilizing operations to address the conditions, is of primary importance. The Contractor shall ensure that its activity reflects that importance.

## **2.4 Emergency Situations**

The Contract Administrator has the right to determine the existence of an emergency situation and when such an emergency situation is deemed to exist, the Contract Administrator may instruct the Contractor to take action to remedy the situation. If the Contractor does not take timely action or if the Contractor is not available, the Contract Administrator may direct others to remedy the situation.

If the emergency situation was the fault of the Contractor, the remedial work shall be done at the Contractor's expense. If the emergency situation was not the fault of the Contractor and not identified as a lump sum activity, the Contract Administrator will pay for the remedial work.

If the Contractor is of the opinion that there is an emergency arising with respect to any portion of the work, pursuant to which there is an imminent risk to life, safety, property or the environment, the Contractor may, upon such notice to the Contract Administrator as may be reasonably possible in the circumstances, perform or cause to be performed such work as may be reasonably necessary to avoid such imminent risk. As soon as practical, the Contractor shall give to the Contract Administrator a notice setting forth the nature of the emergency and performance of any work arising from an emergency shall require approval of the Contract Administrator. The Contractor agrees that the cost of such emergency work and any remedial work required as a result thereof shall be borne solely by the Contractor if the Contract Administrator, acting reasonably, does not approve the nature of the emergency work or the manner in which such emergency work has been performed; or the emergency arose as a result of a default by the Contractor or the negligence or willful misconduct (whether by act or omission) of the Contractor.

## **2.5 Delays in the Work**

The Contract Administrator expressly acknowledges that it has physical possession of, is responsible for and has control over the condition of the Premises. If the Contractor is delayed in the performance of any portion of the Work by the application of a by-law, by a stop work order (providing the order was not issued as a result of an act or omission of the Contractor), by labour disputes, lock outs, fire, or by any other circumstance reasonably beyond the Contractor's control, including extremely heavy winter conditions, then the time for the performance of that portion of the Work shall be extended until the Contractor is no longer so delayed. If during any particular attendance the Contractor is unable to perform Work in an area of the Premises due to the presence of any vehicles, structures or equipment on the Premises, the Contractor will not be required to perform the Work in those areas until the Contractor's next attendance at the Premises.

## **2.6 Damages**

### **2.6.1 Third Party Damages to Contract Administrator's Property**

If in the course of winter maintenance the Contractor learns of any third party damage to the Contract Administrator's property, it is the responsibility of the Contractor to contact the Regional Police and

prepare an accident report. These accident reports are to be delivered to the Contract Administrator within **[fourteen (14)]** days of the date of the accident.

### **2.6.2 Damages to Contract Administrator's Property Caused by the Contractor**

**[The extent to which the Contractor is responsible for damages caused by winter maintenance activities must be determined. Option 1 is more lenient, allowing some damage to paved surfaces and vegetation due to the application of deicing chemicals. Option 2 requires the Contractor to remedy all such damages, and therefore may encourage the Contractor to apply deicing chemicals in a more judicious manner].**

#### **[Option 1:]**

The Contractor shall be responsible for and shall restore at its expense all damage to the property of the Contract Administrator caused by the Contractor in the performance of the Work which damage was not reasonably foreseeable as a consequence of the Contractor's performance of this Agreement. The Contract Administrator acknowledges that some damage to the property of the Contract Administrator is reasonably foreseeable as a consequence of the Contractor's performance of this Agreement, which reasonably foreseeable damage includes, but is not limited to, damage to concrete, asphalt, sod, grass and planting materials due to the application of ice melting products and surface damage to curbs and asphalt due to the clearing of snow and ice.

#### **[Option 2:]**

The Contractor is responsible for all damages caused by their equipment in providing this service and materials used (i.e. salt damage to grass areas from the application of excess salt). The Contractor shall make good all necessary repairs prior to **[date]** of the preceding year to the satisfaction of the Contract Administrator. Failure to make the necessary repairs shall result in the Contract Administrator making arrangements for the repairs and the Contractor paying full compensation for these repairs as Liquidated Damages.

Prior to commencing operations under this contract, the Contractor shall make arrangements with the **[Works Superintendent – or, name the appropriate authority]** to inspect and document the condition of all the parking lots with a representative of the Contract Administrator.

### **2.6.3 Damages to Specialized Devices, Fences, Utility Poles, Grass, Mailboxes, Etc., Caused by the Contractor**

If the Contractor causes damage to the specialized devices, fences, utility poles, boulevard areas, mailboxes etc. the cost of repair or replacement will be borne by the Contractor.

## 2.7 Basis of Payment

### [Option 1: Unit Price per Event]

The unit prices submitted for each item shall be inclusive of furnishing all materials, equipment, labour, and transportation to perform and complete the work and shall be inclusive of HST.

Payment shall be in the form of monthly invoices submitted by the Contractor at the unit price tendered for the services provided. Payment shall be considered full compensation for all labour and materials supplied and delivered as part of this Contract. Invoicing shall be inclusive of monthly standby cost, plus winter maintenance services provided for the various storm events. Any liquidated damages incurred by the Contract Administrator will be subtracted prior to payment. The Contractor is not entitled to interest for late payments.

The Contractor is to state the Unit Prices for various types of winter events in Section 14, Form of Tender.

### [Option 2: Lump Sum per Season]

The Contractor will be paid for the Fixed Price Work, Ice Melting Services, and Extra Work as follows:

#### *The Fixed Price Work*

In consideration of the performance of the Fixed Price Work the Contract Administrator will pay the Contractor a lump sum by way of [12] monthly payments, from [date] to [date]. The Contractor will also invoice the Contract Administrator for items of Additional Work and Extra Work, if any, monthly. All invoices are due and owing within [thirty (30)] days of the date thereon and unpaid invoices will attract interest at a rate of [2]% per month, [24]% per annum.

Should the Contract Administrator default in any payment of a monthly installment of the Fixed Price Work or invoice for Extra Work as aforesaid, the Contractor may give Notice of said default to the Contract Administrator and should said default remain uncorrected for a period of [(5) five] days thereafter, the Contractor without further notice to the Contract Administrator may stop work under this Agreement such that all of the Contractor's obligations hereunder will be suspended without limitation, the Contract Administrator will have the sole responsibility to engage a reasonable and effective system to monitor and manage the condition of the Premises, the Contractor will not be responsible for any damages or claims whatsoever relating to or caused in whole or in part by the failure to perform services to the Premises and the Contract Administrator will indemnify and safe harmless the Contractor and its agents and employees from and against any such claims.

#### *Ice Melting Services*

The application of Ice Melting Products is included in the Fixed Price work described above.

### *Additional Work*

**[Remove this clause if the Fixed Price Work includes all Snowfalls in a given season.]**

Snow Clearing for the first **[X]** Snowfalls is included as part of the Fixed Price Work, after which the Contractor will be paid for each additional Snowfall as Additional Work, the sum set out in Section 14, Form of Tender.

### *Extra Work*

It is not intended that the Contractor should perform any work or services not described in or properly inferable from this Agreement. The Contract Administrator may request that the Contractor perform extra work or services (“Extra Work”) by **[describe how the Contract Administrator is to contact the Contractor to request that Extra Work be performed]**.

The Contractor will not unreasonably withhold its agreement to perform Extra Work. If the Contractor agrees to perform Extra Work, the Contractor will do so within a reasonable period of time having regard to the timing of the request and the volume of work the Contractor is otherwise committed to. The Contractor will be paid for the performance of Extra Work, including Snow Relocation and Snow Removal, as set out in Section 14, Form of Tender.

## **2.8 Performance Unsatisfactory**

The Contractor shall provide the level of service as specified throughout the duration of his contract. Failure to do shall result in the forfeit of the monthly standby cost and **[amount]** Dollars (**[\$X]**) per calendar day in Liquidated Damages.

The Contract will be deemed to be in default when the Contractor fails to:

**[Modify the following provisions as needed.]**

- Perform any specification, term or requirement included herein, in a good and proper manner.
- Provide any deliverable(s) in accordance with the Requirements incorporated in the Contract.
- Adhere to specified delivery requirements and/or dates.

## **2.9 Changes to Work Force**

The Contractor was successful, in part, because of the qualification and abilities of the management and supervisory individuals listed in the Contractor’s Tender. If the Contractor wishes to replace any of its management or supervisory staff, such replacement shall be subject to approval (not to be reasonably withheld) by the Contract Administrator. The replacement individual must have skills and abilities similar to the employee being replaced. The Contractor shall notify the Contract Administrator of the proposed change in staff and will provide the Contract Administrator with information outlining the skills and abilities of the replacement individual.

## 2.10 Changes in the Work

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

If, in the opinion of the Contract Administrator, such changes affect the cost of conducting operations, the value of the change to the Contract amount and the method of determining such value shall be negotiated and the lump sum adjusted.

## 2.11 Innovation

### 2.11.1 General

**[Name of municipality or organization]** encourages the Contractor to be innovative. The Contractor may submit innovative proposals for the Contract Administrator's approval regarding:

- routine work innovation;
- partnering innovation; or
- commercial innovation,

for which more details are provided in the following sections.

The Contractor shall absorb all costs incurred in preparing an innovation for submission to the Contract Administrator. Costs incurred by the Contract Administrator in evaluating, approving or rejecting and administering an innovation will be borne by the Contract Administrator. The Contract Administrator reserves the right to negotiate any conditions it deems appropriate for implementation of the innovation.

### 2.11.2 Routine Work Innovation

The Contractor may submit to the Contract Administrator, in writing, innovation proposals for modifying the Maintenance Special Provisions, proposal or other requirements of the Contract. The length and the detail of the submission will depend on the magnitude of the proposed change. The following information shall be provided with each innovation submitted:

- a statement, requesting the Contract Administrator to consider an amendment to the Contract;
- a description and rationale of the innovation;
- a description of the difference between the existing Contractor requirement and the proposed innovative initiative;
- a statement outlining the basis of the innovation and benefit to the Contract Administrator;

- a description of how the terms of the Contract will be altered;
- a statement of the date by which an approval must be issued; and
- a statement outlining the financial savings to all parties.

### 2.11.3 Partnering Innovation

The Contractor may submit to the Contract Administrator, in writing, innovative proposals for which the Contractor and the Contract Administrator may wish to partner. The initiative must be advantageous to the Contract Administrator. The following information shall be provided with each partnering innovation proposal:

- a statement requesting the Contract Administrator to consider an amendment to the Contract;
- a description and rationale for the innovation;
- a description of the difference between the existing requirement and the proposed innovative initiative;
- cost(s) of the initiative and cost benefit analysis showing the benefits to the Contractor and the Contract Administrator;
- the apportionment of the cost of the initiative;
- a description of how the terms of the Contract will change; and
- a statement of the date by which an approval must be issued.

### 2.11.4 Commercial Innovation

The Contractor may submit to the Contract Administrator innovative proposals for incorporating commercial activities with respect to the Area Winter Maintenance. The Contract Administrator will share with the Contractor all revenues generated by the proposed initiative. The following information shall be provided with each commercial innovation proposal:

- a statement requesting the Contract Administrator to consider a commercial innovation involving the Area Winter Maintenance;
- a description of the proposal;
- a business case outlining the cost, revenue and the Contract Administrator's share of the profit;
- effects the development will have on the highway system, i.e. traffic patterns; and
- a business agreement for the Contractor and the Contract Administrator to sign, outlining the terms of the undertaking.

## 2.12 Facility Security

The Contractor shall adhere to **[name of municipality or organization]'s [name of security manual or policy, if applicable]**. The Contractor is required to obtain any necessary security access cards and/or keys as required for entrance into facilities from the Contract Administrator no later than **[date]**. All security access cards and keys shall be returned to the Contract Administrator no later than **[date]**. Failure to return these items will result in liquidated damages in the amount of **[\$X]**.

## 2.13 Contractor Training

The Contractor shall train all their operations staff employed under this contract in the proper and timely use of deicing and anti-icing chemicals available along with snow clearing and snow storage techniques to minimize the use of deicing chemicals. The use of liquid anti-icing and pre-wetted deicing materials is encouraged.

To be eligible for this Contract, the Company must provide proof of intent to be certified under the *Smart About Salt*<sup>™</sup> Program ([www.smartaboutsalt.com](http://www.smartaboutsalt.com)) and become a *Smart About Salt* Certified Contracting Company by **[date]**. The *Smart About Salt*<sup>™</sup> Winter Salt Management Program, run by the Smart About Salt Council, is a voluntary recognition program about using salt wisely to ensure winter safety, preserve our drinking water and protect the environment. Any Contractor that fails to provide proof of Registration or Certification by the specified date will be disqualified from bidding or continuing with a Contract. Accepted proof of Certification is listing as a Certified Contracting Company on the *Smart About Salt* Website or written acknowledgement of Registration or Certification from the *Smart About Salt Council*.

Currently, there are two training sessions planned for **[date]** in Milton and **[date]** in Cambridge. The Contract Administrator will pay the costs for successful completion and accreditation of at least **[four (4)]** staff members of the successful Contractor. **[If the Contract Administrator does not wish to cover the costs of Contractor Training, remove this provision.]**

## 2.14 Environmental

In order to contribute to waste reduction and to increase the development and awareness of environmentally sound purchasing, acquisitions of goods and services will ensure that wherever possible, specifications are amended to provide for expanded use of durable products, reusable products and products (including those used in services) that contain the maximum level of post-consumer waste and/or recyclable content, without significantly affecting the intended use of the products or service. It is recognized that cost analysis is required in order to ensure that the products are made available at competitive prices.

## 3 INSTRUCTIONS TO CONTRACTORS AND GENERAL CONDITIONS

**[This section contains general information for Contractors regarding the bid submission process. Include any rules, terms and/or conditions stipulated by the organization here, such as: Purchasing Policies; Conflict of Interest Statement; No Collusion; Addenda; Period of Validity of Proposals and Agreement; No Assignment; Waiver of Rights in Proposal and Indemnity; Indemnity; Liability for Errors; Workers' Rights; Human Rights; Contractor's Obligations; Confidentiality; Prohibition Against Gratuities; Applicable Law; Not Liable for RFP Costs; No Obligation to Contract; Dispute; Contract Payments; Freedom of Information and Protection of Privacy Act; Errors and Omissions in RFP; No Waiver; Etc.]**

## 4 TENDER SUBMISSION REQUIREMENTS

### 4.1 General Response Requirements

The Proposal must be well-ordered, detailed, comprehensive, readable, suitably bound, and provide, to the extent practical, information directly rather than by making references to appendices, technical manuals, etc.

### 4.2 Proposal Content

**[Modify the following requirements as desired.]**

The proposal must include the following information:

- A brief description of your understanding of the Work
- Description of the proposed methodology and approach to managing the Work (phased activities, briefings, or reports and how communications and service will be handled). Contractors are encouraged to be creative in their approach to investigating best practices.
- Description of deliverables and results (products and services)
- Proposed resources and detailed work plan/schedule that demonstrate/describe the Contractor's understanding of the project scope, goals and objectives
- Describe potential obstacles or parameters to consider
- Indication of the specific people who will be performing the Work and their individual experience and qualifications
- Identify the key individual who will manage the project and interface with **[name of municipality or organization]** staff
- Fee schedules
- Any other comments or suggestions relating to the success of assignment

Ensure pages do not exceed 8 ½ x 11, and are numbered and identified with your firm's name. The contractor must submit the following:

- List of Equipment (Section 10)
- List of Proposed Sub-Contractors (Section 11)
- Tenderer's Experience in Similar Work (Section 12)
- Tenderer's Senior Staff (Section 13)
- Form of Tender (Section 14)
- Form of Irrevocable Offer (Section 14)
- Workplace Safety and Insurance Clearance Certificate
- Tender Deposit
- Agreement to Bond

### 4.3 Form of Tender

Tenders must be submitted on the attached “Form of Tender”, Section 14 and enclosed in an envelope addressed to **[name of party and mailing address]**, which clearly identifies the document(s) enclosed as a Tender, gives note of the Tender number and the name and address of the Contractor.

**[Name of municipality or organization]** bears no responsibility for any tender(s) which are lost, misplaced or are not considered.

All unit prices must be clearly indicated and all extensions and lump sum prices written in figures. Contractors will be allowed to attach descriptive literature for the sole purpose of amplifying the bid. Adjustments by fax or letter to a Tender already submitted will not be considered. The Tender Form must be properly completed and witnessed in the spaces provided on the Form and signed by the Contractor or responsible official of the firm bidding. If a joint bid is submitted, it MUST be signed, addressed and witnessed on behalf of each Contractor.

## 5 COMMUNICATIONS AND SCHEDULE

### 5.1 Inquiries

It will be the Contractor’s responsibility to clarify any details in question before submitting a bid. All inquiries regarding this Request for Tender must be in writing by fax or e-mail to **[name, title, e-mail address, phone number, fax number]** no later than **[date]**. After this date, no further inquiries or concerns may be submitted. The Contract Administrator bears no responsibility for any oral communication, instruction, or suggestions.

The Contract Administrator reserves the right to distribute a notice of content of any inquiry and the Contract Administrator’s response to all other registered Contractors. All questions pertaining to this Request for Tender must be submitted in writing.

### 5.2 Revision of Proposal

A Contractor may revise a proposal on the Contractor’s won initiative at any time before the deadline for submission of proposals. The Contractor must submit the revised proposal in the same manner as the original. A revised proposal must be received on or before the proposal due date.

At any time during the proposal evaluation process, the Contract Administrator may require a Contractor to provide oral or written clarification of it proposal. The Contract Administrator reserves the right to make an award without further clarifications of proposals received.

### 5.3 Schedule of Events

The following schedule of events will apply to the selection process. **[Modify as needed.]**

**Table 1:** Schedule of Events

Event	Date
Release of Request for Tender	<b>[Fill in this table with the appropriate dates.]</b>
Mandatory project briefing and site tour	
Deadline for Contractor questions	
Deadline for submission of proposal	
Evaluation of written proposals completed	
Interview with short-listed Contractors	
Board/Council approval	
Letter of Intent issued	
Execution of Agreement	
Commencement of the work	

## 6 EVALUATION/SELECTION CRITERIA AND PROCESS

### 6.1 Proposal Evaluation/Selection Criteria

Submissions will be evaluated by an evaluation team composed of **[staff from the municipality or organization, an advisory committee, etc.]**.

The Contractor will be evaluated on the basis of its Proposal and the selection criteria outlined in Table 2.

**[Modify the evaluation criteria and points available as desired. This section presents an opportunity for the Contract Administrator to consider attributes other than costs when evaluating Contractor submissions, such as the Contractor’s implementation of best management practices for salt use.]**

**Table 2:** Tender Evaluation Criteria

Evaluation criteria	Points available to be awarded
1. Financial <ul style="list-style-type: none"> <li>a. Lump sum cost</li> <li>b. Cost of extra work</li> </ul>	<b>[30]</b>
2. Qualifications and references <ul style="list-style-type: none"> <li>a. Company history and background</li> <li>b. Company experience</li> <li>c. Completed winter maintenance contracts of similar size and scope</li> <li>d. Experience and qualifications of project manager</li> <li>e. Comments from references</li> <li>f. Smart About Salt certification of all employees</li> </ul>	<b>[15]</b>
3. Methodology and approach <ul style="list-style-type: none"> <li>a. Understanding of the RFT and approach to RFT objectives</li> <li>b. Technical approach and flexibility to conditions</li> <li>c. Implementation of BMPs for road salt use</li> </ul>	<b>[20]</b>
4. Winter maintenance equipment <ul style="list-style-type: none"> <li>a. Proportion of fleet equipped with pre-wetting units</li> <li>b. Proportion of fleet equipped with anti-icing units</li> <li>c. Proportion of fleet equipped with ground speed spreader controls</li> <li>d. Proportion of fleet equipped with GPS/AVL technologies</li> <li>e. Fleet and equipment meet the specifications stated in the RFP (if applicable)</li> </ul>	<b>[20]</b>
5. Additional incentives	<b>[5]</b>
6. Proponent’s presentation of proposal, response to questions, and performance during the interview	<b>[20]</b>
<b>Total available score</b> <b>[May stipulate a minimum score (eg. 60%) to qualify for the short list.]</b>	<b>[100]</b>

## 6.2 Confidential Discussions/Interview/Presentations

The Contract Administrator reserves the right to incorporate confidential discussions, interviews, and/or presentations into the proposal evaluation process at the short list stage for the purpose of this Agreement. The Contract Administrator, at its sole discretion, will interview short-listed proponents. The Contract Administrator reserves the right to limited interviews up to a maximum of the six top scoring proponents. Those short listed proponents may be asked to make a short formal presentation to the evaluation team.

The interview will serve as the mechanism for further evaluation of proposals of short-listed proponents at an in-depth and more detailed level to establish the finalist(s). The further detailed evaluation will take into account the discussions, presentations and clarifications with/by short listed proponents.

During interviews, short-listed proponents will be ranked for their presentation of proposal and ability to answer questions.

## 6.3 Requests for Clarification and Negotiation

After the receipt of proposals and at any time prior to execution of Agreements, the Contract Administrator may request clarification of proposals from any proponent.

The Contract Administrator may adjust the evaluation score or ranking of a proposal as an outcome of the clarification.

The Contract Administrator reserves the right, at any time, to modify the requirements of the work where circumstances require.

## 6.4 De-Briefing

After the Tender is awarded, an unsuccessful Contractor may request a debriefing session to discuss their Tender. The Contractor may contact the Purchasing representative **[or name the position of the appropriate party]** as specified in the bid document. The project representative(s) will conduct a debriefing, by telephone, for the purpose of explaining the evaluation process, discussing the Contractor's Tender and its ranking, and explaining why the Contractor's Tender was not selected. Only the submission of the unsuccessful Contractor will be reviewed.

## 6.5 Formal Contract

If a preferred proponent is selected for the delivery of service, the proponent shall be prepared to enter into a contract in a form that is satisfactory to the Contract Administrator that will allow the Contract Administrator the use of concepts, products, and processes produced or resulting from the services rendered by the proponent in connection with the project. This proposal shall constitute part of the terms and conditions of the contract award.

## 7 MAINTENANCE SPECIAL PROVISIONS

### 7.1 Winter Maintenance Definitions

**[Modify these terms as desired.]**

The **Drawings and Specifications** are attached as Section 10, form part of this Agreement and also include any site map prepared by the Contractor and approved, before or after execution of this Agreement, by the Contract Administrator (the “**Site Map**”).

The **Snow Clearing Areas** are described in the **Drawings and Specifications** and are those areas upon which snow **Clearing** is to occur.

**Snow Stockpiling Areas** are those areas to be determined at the discretion of the Contractor where **Cleared** snow will be accumulated, subject to **Relocation** or **Removal**.

**Ice Management Areas** are those areas upon which **Ice Melting Products** are to be applied, through truck, machine and/or hand applications, in accordance with the **Drawings and Specifications**.

**Clearing** involves moving snow from the **Snow Clearing Areas** to the **Snow Stockpiling Areas** through **Plowing, Pushing** or **Shoveling** as specified in the **Drawings and Specifications**. “**Clear**” has a corresponding meaning.

**Plowing** involves the **Clearing** of snow through the use of a plow or blade attached to truck vehicle. **Plow** has a corresponding meaning.

**Pushing** involves the **Clearing** of snow through the use of a plow attached to a vehicle or motorized piece of equipment which is not a truck vehicle, including a front-end loader. **Push** has a corresponding meaning.

**Shoveling** involves the **Clearing** of snow through the use of hand tools, including shovels pushers, blowers and brooms. **Shovel** has a corresponding meaning.

**Relocation** involves relocating snow from the perimeter of the **Snow Clearing Areas** to another location on the **Premises** in accordance with the **Drawings and Specifications** or as directed by the Contract Administrator. **Relocate** has a corresponding meaning.

**Removal** involves relocating snow from the perimeter of the **Snow Clearing Areas** to a location outside the **Premises** in accordance with the **Drawings and Specifications** or as directed by the Contract Administrator. **Remove** has a corresponding meaning.

**Ice Melting Products**, for the purposes of this Agreement, include **[list all acceptable ice melting products here]**.

A **Snowfall** commences when snow begins to accumulate upon the **Premises** and ends when the continuous accumulation upon the **Premises** ceases.

## 7.2 Implementation of Best Practices for Salt Use on Parking Lots

In 2001, Environment Canada released an assessment report stating that road salts are entering the environment in large amounts and are posing a risk to plants, animals, birds, fish, lake and stream ecosystems and groundwater. The report recommended that salt be designated toxic under the Canadian Environmental Protection Act (CEPA). It should be noted that Health Canada has stated that road salts are not harmful to humans. Although road salts were never officially designated as CEPA-toxic, Environment Canada's assessment report initiated the development of a risk management strategy for road salts, which is based on a voluntary best practices approach.

In 2004, Environment Canada released a document entitled "Best Practices for Salt Use on Parking Lots and Private Roads." It is a guidance document dealing with the environmental management of road salts used for the control of snow and ice on parking lots and private roads. The intention is that it be used as advice to property owners and contractors for consideration in the development of their own practices, policies and procedures.

To this end, good handling procedures and practices for salt handling, storage and distribution are to be followed at all times and shall incorporate pre-wetting and anti-icing practices in the distribution of salt in **[name of municipality or organization]** parking lots throughout the term of this contract.

## 7.3 Length of Operating Season

### **[Option 1: Operating season includes a transition phase]**

The following dates identify the median for the first and last snowfall of **[25]** mm or more. Depending on local needs, these dates shall be considered when maintaining resources at full readiness. Staff and equipment, however, must be "phased in" a minimum of one month before and "phased out" a minimum of one month after the dates shown, in order to cope with early and/or late storms. This "phase-in" and "phase-out" period is referred to as the transition period.

Period of full resource readiness: **[November 15th – March 31<sup>st</sup>]**

These dates have been established from compiling data from years of past experience and monitoring weather patterns.

Long-term forecasts shall be monitored to aid in deciding when equipment should be readied for unusually early and late storms including those outside the transition period. Previous local history and experience could also be obtained from the Contract Administrator.

The Contractor shall maintain a minimum **[75]**% of combination units at each winter yard for the **[fifteen (15)]** days immediately prior to and **[fifteen (15)]** days after the median dates identified above.

The Contractor shall maintain a minimum of **[50]**% of combination units at each winter yard for the **[thirty (30)]** days prior to and **[thirty (30)]** days after the median dates identified above.

**[Option 2: Operating season does not include a transition phase]**

The duration of this contract will be from the [1<sup>st</sup>] day of December of the current year and expire the [31<sup>st</sup>] day of March the following year.

## 7.4 Level of Service for Parking Facilities

**[The Level of Service includes the desired pavement condition, the time to meet this condition, and the callout condition (the condition when winter maintenance activities are to begin). The Contract Administrator must specify either a single level of service or variable levels of service for parking facilities. Variable levels of service are typically based on characteristics of the parking facility such as the hours of operation, vehicle and pedestrian traffic volume, and/or the type of surface being treated.]**

**[Option 1: Single Level of Service]**

*The Fixed Price Work*

The Contractor will monitor the weather conditions in the vicinity of the *Premises* and perform the *Fixed Price Work* once in accordance with the *Drawings and Specifications* within [X] hours of the commencement of a *Snowfall*. If a further accumulation of [X] or more [cm/inches] of snow occurs during that *Snowfall*, the Contractor will return to perform the *Fixed Price Work* in accordance with the *Drawings and Specifications* within [X] hours following the end of that *Snowfall*.

For the purposes of this Agreement, a *Snowfall* commences when [X cm/inches] or more of snow has accumulated upon the *Premises*, continues while the snow continues to accumulate upon the *Premises* and ends when the continuous accumulation upon the *Premises* has ceased for a period of [X] hours.

The Contractor shall perform operations and manage the snow in the parking lots in a manner to achieve the required service objectives, to minimize snow drifting and minimize ice events from freeze thaw cycles.

Where the Contract Administrator and Contractor cannot agree as to whether or not a *Snowfall* has occurred in any particular circumstance, the records of Environment Canada for the location nearest the *Premises* will be utilized to determine the same.

**[Option 2: Variable Levels of Service]**

This Maintenance Special Provision establishes levels of service for snow and ice control for [name of municipality or organization] parking facilities.

The guidelines are provided to maintain a consistent level of service for varying classes of parking facilities.

Winter traffic volumes, which include vehicle and pedestrian traffic and operational needs, are the primary indicator used to determine the winter level of service for each class of winter operation. For

the purpose of this tender, all facilities are divided into four classes: Class 1, 2, 3, and 4; Class 1 being the highest level of service and Class 4 being the lowest. A general summary has been provided below for each class.

The following will apply to all parking facilities under contract and will be used by all maintenance service providers for **[name of municipality or organization]**.

#### *Class 1*

The defined level of service for Class 1 is essentially bare pavement, and is the objective to be reached as soon as reasonably possible after the storm has ended or abated, normally within 3 hours. This level of service applies to hard-surfaced driveway and parking areas with the heavy pedestrian and vehicle traffic volumes in a 24 hour facility and the need to ensure 24 hour accessibility. To achieve this level of service, plowing and spreading of salt and sand shall continue as required, utilizing all required resources identified in the Contractor's Proposal.

#### *Class 2*

The defined level of service for Class 2 is essentially bare pavement, and is the objective to be reached as soon as possible after the storm has ended or abated, normally within 4 hours or before 07:00 AM, whichever comes first. This level of service applies to hard-surfaced driveway and parking areas with the heavy to moderate pedestrian and vehicle traffic volumes in a 24 hour facility and the need to ensure accessibility during working hours. To achieve this level of service, plowing and spreading of salt and sand shall continue as required, utilizing all required resources identified in the Contractor's Proposal.

#### *Class 3*

The defined level of service for Class 3 is essentially bare pavement, and is the objective to be reached as soon as possible after the storm has ended or abated, normally within 8 hours. This level of service applies to hard-surfaced driveway and parking areas with the moderate to light pedestrian and vehicle traffic volumes in a 24 hour facility and the need to ensure eight hour accessibility. To achieve this level of service, plowing and spreading of salt and sand shall continue as required, utilizing all required resources identified in the Contractor's Proposal.

#### *Class 4*

The defined level of service for Class 4 is essentially bare pavement, and is the objective to be obtained. A minimum of centre bare condition (2.5 metres width), should be reached within 12 hours after the storm has ended or abated and be maintained until conditions permit barring the pavement full width. This level of service applies to hard or granular-surfaced driveway and parking areas with the light to occasional pedestrian and vehicle traffic volumes in a 24 hour facility and the need to ensure eight (8) hour accessibility. To achieve this level of service, plowing and spreading of salt and sand shall continue as required, utilizing all required resources identified in the Contractor's Proposal.

The following is a guide of operations utilized for a typical storm. Conditions will dictate the appropriate work required.

**Table 3:** Minimum Maintenance Standards

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>
Primary Objective:	Essentially Bare Pavement	Essentially Bare Pavement	Essentially Bare Pavement	Essentially Bare Pavement
Time to Meet Primary Objective ASAP after the storm, not exceeding:	3 Hrs.	4 Hrs.	8 Hrs.	Centre-bare within 12 Hrs. And essentially bare pavement when conditions permit.
<b>SALTING</b> Begin salting when snow accumulation: • Or before freezing rain produces icy conditions • Follow-up salting**:	>0.5 cm  When required	>0.5 cm  When required	>1.25 cm  When required	>1.25 cm  N/A
<b>PLOWING</b> • Begin plowing snow when accumulation***:	≥ 2.5cm	≥ 2.5cm	≥ 5.0cm	≥ 10.0cm

\*\*Follow-up salting will be determined by the precipitation, road conditions and weather. The goal is to maintain as good a driving surface as possible in the conditions.

\*\*\* Generally, salt on the road takes time to become fully effective and; therefore, plowing should not normally occur until at least ½ hour after the salt has been placed, but maybe less if warranted because of snow accumulations, ambient temperature and traffic volume. Once plowing operations are warranted, plowing shall be continuous from the beginning of the storm and continue for the duration of the storm for all service levels. Effective plow speed should not exceed [X] kmh. Plowing operations shall commence when [2.5] cm or greater of snow or slush has accumulated on the road surface. However, if the driveway or parking areas are hazardous, slippery, or ice or slush is developing, the winter operation shall be deployed.

In general practice, the number of spare units required will be approximately 10% of the working complement.

## 7.5 Responsibilities of Contractor

### 7.5.1 General

All Contractor's staff engaged in winter maintenance activities are responsible to ensure that snow and ice control operations are performed to accomplish the prescribed levels of service. The Contractor is

responsible for ensuring that all staff is aware of the levels of service assigned to each facility within the contract.

The Contractor shall ensure that the contents and prescribed treatments are followed when weather and accessibility conditions dictate the need for winter maintenance operations.

When conditions dictate the need for a winter maintenance operation, the Contractor's supervisor on duty is responsible for organizing the necessary resources to achieve the level of service.

### **7.5.2 Salt Management Plan**

The Contractor shall meet the goals and objectives of the **[name of municipality]**'s Salt Management Plan through continuous improvement methods.

### **7.5.3 Response Time**

From the time unfavourable winter conditions are detected and winter equipment is required, the Contractor has a maximum of **[½ hour]** to have the required operator(s) in the vehicles(s) and equipment ready to begin work. For spreaders, this means in the process of having the spreader(s) filled with sand or salt and liquid deicers. For plowing, this means en route to the area of concern. For the safety of the employees of **[name of municipality or organization]**, it is essential that the response time be kept to a minimum.

### **7.5.4 Extenuating Circumstances**

Winter operations will continue until the prescribed level of service is achieved where conditions permit. Should conditions not permit accomplishment of the prescribed level of service, operations shall continue as required to maintain a safe travelling surface for vehicles & pedestrians.

While this Maintenance Special Provision establishes levels of service, it is acknowledged that conditions may occur, which temporarily prevent achieving levels assigned. In such cases, attempts shall be made to keep parking facilities open by utilizing all of the Contractor's equipment as defined in the Contractor's Proposal at maximum efficiency.

When it becomes evident to the Contractor that available resources are not sufficient to maintain driveway and parking areas open and passable, the Contractor is to notify the Contract Administrator who will in turn notify the Operation Manager or Supervisor.

## **7.6 Decision-Making Tools**

### **7.6.1 Road Weather Information Systems (RWIS)**

There are **[X]** RWIS stations in the vicinity of the parking facility, located at:

**[List the locations of any RWIS sensors in the area]**

To access the RWIS information, the Contractor will require, at his cost, sufficient computer hardware to view and access the internet and an internet service provider account. **[Describe how the Contractor may access RWIS information, and procedures for acquiring passwords (if applicable).]** The availability and accuracy of this information is not guaranteed and shall be confirmed by other available sources.

### 7.6.2 Local Weather Forecasts

Local weather reports should be monitored closely to ascertain the nature, timing, and duration of winter storms and icing events. The Contractor shall ensure they have the proper resources to independently inform themselves of current weather conditions and forecasts. **[Optional: Include the name and address of a website where local weather forecasts can be accessed.]**

### 7.6.3 Infrared Thermometers

Pavement temperature trends can be measured using portable infrared thermometers. This information improves decisions about the type and amount of material that must be applied. The Contractor is **[required/encouraged]** to use infrared thermometers to monitor pavement temperature trends and inform winter maintenance decisions

### 7.6.4 Internet-Based Radar

Internet-based radar images can show decision-makers where a storm is in relation to the service area, and help predict the timing of a storm's arrival or departure. The contractor is **[required/encouraged]** to consider internet-based radar images when making operational decisions.

## 7.7 Equipment

### 7.7.1 General

All winter maintenance equipment must conform to the latest standards as described in the *Highway Traffic Act*.

### 7.7.2 Equipment Age

All Contractor's vehicles, plows, spreaders and combination units shall be no older than **[10]** years from the current operating year (i.e. in 2013, the vehicles should have been manufactured no later than **[2003]**).

### 7.7.3 Equipment Specifications

#### [Option 1: Specifications Not Provided]

The Contractor shall provide adequate equipment to do the work. The amount of equipment to be used, but not the type, must be approved by **[name of municipality or organization]**. The type of equipment proposed for use shall be evaluated with the proposed plan.

#### [Option 2: Specifications Provided]

The Contractor will provide all of the necessary equipment to undertake pre-wetting and anti-icing procedures. The following provides general specifications for the equipment required to undertake this work. **[Describe specific specifications for the spreader pre-wetting system, anti-icing truck specifications, and other equipment.]**

### 7.7.4 Spreader Controls

Groundspeed electronic spreader controls have been demonstrated to increase the accuracy of material application rates. Open loop systems adjust the spreader output based on the speed of the vehicle, which is monitored at the speedometer or another sensing point. Closed loop systems take into account both the speed of the vehicle and the discharge rate of the material, by monitoring the liquid flow rate or speed of the auger or conveyer at the discharge point. Closed loop systems have been found to be the most accurate.<sup>15</sup>

To be considered for this contract, all spreader vehicles **[must/should]** be equipped with groundspeed electronic spreader controls. Electronic controllers shall be equipped with a data collection system.

Units that incorporate global positioning systems (GPS) for automatic vehicle location (AVL), and those that have data logging capabilities are **[recommended/required]** in order to more accurately track winter maintenance activities.

#### **7.7.4.1 Detailed Specifications for Electronic Spreader Controls for Both Tandem and Single Axle Combination Vehicles**

Electronic spreader controls for each dual purpose vehicle must comply with the following specifications in all aspects. Although only the major details of the control system are listed, it is the Contractor(s) responsibility to provide a fully equipped system with compatible components to provide dependable efficient service operated from inside of the cab.

**[Modify the following specifications as needed.]**

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<sup>15</sup> Blackburn, B. Fleege, E. and Amsler, D. Calibration Accuracy of Manual and Ground-Speed Controlled Salters, Clear Roads Project CR 2005-02, Wisconsin Department of Transportation, United States.

**System Components:**

The control system shall consist of a programmable microprocessor control console with a LED or LCD display that is easy to read during both day and night operation. The control console shall display to the operator the application rate settings, material selected and indicate any errors. The control system shall include a means to transfer data to a personal computer or to a hand held data transfer mechanism. The data transfer mechanism must have the capability to be connected to a printer directly and thus provide a hard copy of the spread report, or download the data to a personal computer.

**Control:**

The discharge of material shall be controlled proportional to road speed at the pre-programmed application rate by **[units]**.

The control console shall have the following functions:

- Spread rate control
- Spinner speed control
- Spreader on/off button
- Blast button
- Power on/off switch

The control console shall have a self diagnosis capability and display fault codes.

The control console shall be equipped with a visual and audible alarm to inform the operator of a vehicle over speed condition in relation to the system's ability to discharge the programmed application rate.

The control console shall have a PROGRAMMING/CALIBRATION mode separate from the standard OPERATING mode that can be locked out by either a security password, a key or a calibration keyboard.

All operational functions such as material selection, spread rate selection, etc. shall be performed in OPERATING mode only.

The control console software shall be programmed to allow three separate operating modes being MANUAL, OPEN LOOP, and CLOSED LOOP.

The blast function shall be programmed to a fixed application rate or from 0 to 100% of the maximum application setting.

It shall be possible to pre-program a ten(10) separate applications rates per material up to a setting of at least **[maximum desired setting]**.

### Data Collection System:

The spreader control system shall incorporate a data collection system that records all specified data for each event during an operation. A new event occurs every time that:

- the system power is turned on or off;
- the spread rate is changed;
- material selection is changed; or
- event type changes.

The data collected per event shall include:

- Truck number
- Event start date
- Event start time
- Duration of run
- Spread rate (**[units]**)
- Spread distance (km)
- Spread quantity (kg)
- Material type (1=salt, 2=sand, 3=mix, or A, B, C)
- Event type (i.e. power on/off, download, material rate change, spreader over speed, open loop or manual operation)

The system shall incorporate a means to download data from the truck mounted unit to a personal computer or to a hand held data transfer mechanism. The data transfer mechanism must have the capability to be connected to a printer directly and thus provide a hard copy of the spread report, or download the data to a personal computer. The system shall have sufficient memory to store a minimum of one hundred (100) events before downloading is required. At a minimum, the Contractor must download all spreader control data to a personal computer the first business day following all winter operations events. The Contractor must then store the data on CD or portable drive for transfer to the Contract Administrator's electronic database. The system must be compatible with Microsoft Windows XP.

### 7.7.5 Calibration of Spreader Controls

#### **[Option 1:]**

Properly calibrated equipment is one of the keys to the effective placement of de-icer material on roadways, sidewalks, and parking lots. Prior to the **[year]** winter season and each year thereafter, all spreaders will be calibrated for three material weights and three material widths and, during the winter season the equipment will be checked and recalibrated once mid-season and each time there has been work on the vehicle hydraulics system. If the controller does not show the actual amount and width being spread, then a chart showing what settings reflect the amount of material being spread at a given

gate, spinner and conveyor setting will be provided in the truck cab. This calibration shall be performed by an accredited technician.

**[Option 2:]**

Calibration of the spreader unit and electronic controls should occur at least once per year. Documentation of calibration activities must be provided to the Contract Administrator upon request.

A calibration policy should be established to assure the material settings are correct, and should incorporate the following guidance:

- Preferably, if application is by weight, then calibration should also be by weight.
- Because spreaders vary, calibrate each truck.
- Calibrate separately for every type of material you use.
- If a spreader doesn't have different settings, application rates can be varied by adjusting the gate opening and truck speed.
- Place the calibration results for each setting in the truck where it can be easily viewed by the operator.

Calibration checks or recalibration should take place several times during the season, including:

- after repairs;
- when distribution calculations show a discrepancy between theoretical and actual;
- spot-checks on units in the fleet throughout the season.

Equipment manufacturers often provide detailed instructions for calibration. General information can also be found in *Clear Roads' Calibration Guide for Ground-Speed Controlled and Manually Controlled Material Spreaders*.

#### **7.7.6 Automated Vehicle Locators (AVLs)**

The Contractor must install AVL's in each piece of contracted equipment for the duration of the contract and remove the AVL units at the end of each winter season.

The AVL units will be provided by the **[Contract Administrator]**. It will be the responsibility of the Contractor to ensure that all AVL units are maintained in good working order. Should the Contractor determine that an AVL unit is damaged or malfunctioning, it is the Contract Coordinator's responsibility to report it immediately to the **[Contract Administrator]** and ensure a replacement unit is installed immediately. Should the **[Contract Administrator]** determine that an AVL unit is damaged or malfunctioning; the Contract Coordinator will be notified and must immediately install a replacement unit.

All installations repair and removal costs will be borne by the Contractor.

### **7.7.7 Lighting and Safety Equipment**

All Contractor vehicle lighting shall conform to current standards for winter operation.

The Contractor shall have available a sufficient number of traffic cones or other warning devices for marking or delineating a hazard encountered during his operation.

### **7.7.8 Snowplow Markers**

Snowplow markers are to be supplied and installed by the Contractor for the purpose of identifying the location of obstacles as well as acting as guides to plow operators.

Snowplow markers should be installed before the ground freezes: at the beginning and end of any obstructions, pedestrian access, and clearly define the driveway and parking area limits and any area where a potential hazard to plowing operations is perceived.

The snowplow marker and post shall be approved by the Contract Administrator prior to installation.

### **7.7.9 Communications Equipment**

Ensure that communications systems are installed and in proper working order. All Contractors' plows, spreaders and combination units shall have wireless communications, supplied by the Contractor.

#### **Equipment Inspection**

The Contractor must carefully, systematically and regularly inspect all equipment to ensure that plow attachments are securely fastened and that the equipment is adjusted correctly.

### **7.7.10 Equipment Use on Salt Vulnerable Areas**

As new equipment is phased in, priority should be given to allocating the new equipment to roadways and parking lots adjacent to salt vulnerable areas, and reallocating less salt-efficient equipment to less sensitive areas.

## **7.8 Materials**

### **7.8.1 Salt and Sand Specifications**

Salt used for winter maintenance shall conform to OPSS 531 and 2502.

Organic treated anti-icing/de-icing solutions (OTADS) are intended to improve low temperature performance, reduce overall consumption and reduce the effects of corrosion on property and vegetation. For these reasons, base salt (typically NaCl) shall be treated at the source at a 3% ratio with OTADS, that meets the following specifications.

1. The product may not contain in excess of the following established total concentration limits. Results are stated as Parts Per Million (ppm)

<b>Cyanide</b>	0.35 ppm	<b>Chromium</b>	1.00 ppm
<b>Arsenic</b>	5.00 ppm	<b>Cadmium</b>	0.10 ppm
<b>Copper</b>	1.0 ppm	<b>Barium</b>	1.00 ppm
<b>Lead</b>	1.00 ppm	<b>Selenium</b>	5.00 ppm
<b>Mercury</b>	0.05 ppm	<b>Zinc</b>	10.00 ppm

2. pH – The pH of submitted liquid OTADS shall be 7.0 – 9.5, which is considered neutral.
3. OTADS must be Biodegradable and the material shall contain NO additional chlorides.
4. The material must contain sufficient organic compounds to produce a final material having a eutectic freeze point of -30°C or lower.
5. The base organic compound must be a sugar beet extract with a minimum of 55% solids with a minimum sugar content of 10%. The sugar must be subjected to a chemical alkaline degradation to a PH value of at least 11 for a minimum of 24 hours followed with an organic acid to lower the PH range to 8.5 to 9.5.

Treated salt shall conform to Table 1 for Gradation as per OPSS 2502, latest revision. Sand shall meet the requirements of OPSS 531 and OPSS 1004.

### 7.8.2 Low-Chloride Materials

A number of alternatives to road salt are now commercially available, including materials that are low in chloride or chloride-free. The Contractor is encouraged to make use of road salt alternatives in order to reduce the amount of chlorides entering the environment.

Acceptable alternatives to road salt include:

- **List acceptable materials here**

The Contractor must obtain the written approval of the Contract Administrator before using any materials which are not specified in Section 7.8.1.

### 7.8.3 Supply of Materials

Provisions shall be made to ensure that adequate sand and salt will be available for winter usage. All materials necessary for the completion of the work shall be supplied by the Contractor, and the payment provided in the Contract shall be deemed to include full compensation of such materials. The Contractor shall be responsible for ordering, deliveries, checking, rejecting, breakage, theft, unloading and storage of such materials in a manner satisfactory to the Contract Administrator.

The Contractor shall supply a list of suppliers of materials related to the tendered works. The acceptance of a supplier will be at the discretion of the Contract Administrator and persons submitting Tenders may wish to confirm the acceptability of any supplier during the tendering period.

All materials must be from sources that are either on the Designated Sources List, the Aggregate Sources List or approved by the Ministry of Transportation.

#### **7.8.4 Materials Storage and Handling**

Salt and sand/salt mixtures that are improperly stored can cause large amounts of salt to enter the environment. The Contractor must adhere to BMPs for salt storage and handling in order to limit contamination of the local environment.

The Contractor shall, in advance of receipt of shipments of material provide adequate and proper storage facilities acceptable to the Contract Administrator and on the receipt of such material shall promptly place it in storage except where it is to be incorporated forthwith into the work.

The stock pile of salt shall be stored in a salt shed or dome.

Small amounts of treated sand shall be placed in 'sand boxes' on steep hills for use by motorist(s) in emergencies. Sand boxes must be visibly marked and located in safe locations.

The stockpile of sand is to be placed in a sand dome, or under other type of cover. Salt will be uniformly mixed throughout the pile at a minimum rate of 3% per volume for piles in domes. All material shall be stored in an enclosure.

The Contractor should consult TAC's *Syntheses of Best Practices; Road Salt Management – Design and Operation of Road Maintenance Yards* for more information about proper storage and handling techniques.

#### **7.8.5 Inspection and Testing**

All materials provided by the Contractor shall be new, except as approved by the Contract Administrator. Materials supplied by the Contractor shall conform to the requirements of the Contract.

As specified or as requested by the Contract Administrator, the Contractor shall make available for inspection or testing a sample of any material to be provided by the Contractor. The Contractor shall obtain for the Contract Administrator the right to enter upon the premises of the material manufacturer or supplier to carry out such inspection, sampling and testing as specified or as requested by the Contract Administrator. The Contractor shall notify the Contract Administrator of the sources of supply sufficiently in advance of the material shipping dates to ensure the Contract Administrator sufficient time to perform the required inspection, sampling and testing.

The Contract Administrator will not be responsible for any delays to the Contractor's operations where the Contractor fails to give sufficient advance notice to the Contract Administrator to enable the

Contract Administrator to carry out the required inspection, sampling and testing before the scheduled shipping dates. In the event that the Contractor has given the Contract Administrator notice as to the necessity of inspection under this section and the Contract Administrator fails to carry out said inspection within a reasonable period of time, the Contractor may proceed under this Contract and any delays resulting there from shall not be the responsibility of the Contractor.

The Contractor shall not change the source of supply and material without written authorization of the Contract Administrator.

Material, which is not specified, shall be of quality best suited to the purpose required and the use of such material shall be subject to the approval of the Contract Administrator or his designates.

#### **7.8.6 Rejected Materials**

Rejected material shall be removed from the work area site expeditiously after the notification to the effect from the Contract Administrator. Where the Contractor fails to comply with such notice, the Contract Administrator may cause the rejected material to be removed from the work area and disposed of in what the Contract Administrator considers to be the most appropriate manner and the Contractor shall pay the cost of disposal and the appropriate overhead charges.

#### **7.8.7 Substitutions**

Where the specifications require the Contractor to supply a material designated by a trade or other name, the bid price shall be based only upon supply of the material so designated, which shall be regarded as the standard of quality required by the specification. After the acceptance of the Contractor's tender, the Contractor may apply to the Contract Administrator to substantiate another material identified by a different trade or other name for the material designated as aforesaid. The application shall be in writing and shall state the price for the proposed substitute material designated as aforesaid, and such other information as the Contract Administrator may require.

Rulings on a proposed substitution will not be made prior to the acceptance of the Contractor's tender. Substitutions shall not be made without the prior approval of the Contract Administrator, such approval not to be unreasonably withheld. The approval or rejection of a proposed substitution will be made at the discretion of the Contract Administrator.

If the Contract Administrator approves of the proposed substitution, the Contractor shall be entitled to the first \$[X] of the aggregate saving in cost by reason of such substituting and to [X]% of any additional saving in cost in excess of such \$[X]. Each such approval shall be conveyed to the Contractor in writing by the Contract Administrator.

### **7.8.8 Documenting Materials Received**

The Contractor shall provide the Contract Administrator, immediately upon receipt of each shipment, copies of bills of landing, or such other documentation the Contract Administrator may require to substantiate and reconcile the quantities of material received.

## **7.9 Operational Considerations**

The **[name of municipality]**'s Salt Management Plan endorses the judicious, timely application of salt to achieve the required level of service and reduce the amount of salt affecting the environment.

The Contractor shall demonstrate in the proposal a complete understanding of pre-wetting and anti-icing techniques, procedures, and their role in the overall salt distribution program for **[name of municipality/organization]**'s facilities. The Contractor shall ensure that all operators are familiar with the Premises and these spreading techniques.

### **7.9.1 Materials Spreading**

In no case shall the spread pattern formed by the material extend beyond the boundaries of the parking lot. Spreading techniques are outlined in the Salt Institute's Handbook, "*The Snow Fighters*".

#### **7.9.1.1 Direct Liquid Application (DLA)**

Preventing a snow or ice bond to a paved surface is much more efficient than destroying the bond after it has formed, and so preventive strategies should be the top priority.

DLA material should be applied on all roadways prior to the accumulation of frost, snow or ice, followed by plowing and/or spreading operations where weather and/or road conditions warrant. The Contractor shall be responsible to monitor weather and roadway conditions to determine when the conditions are appropriate for application of DLA. DLA, once applied, can be effective for a period of up to three days if not removed by weather. Weather and roadway conditions (air and surface temperature, precipitation, etc.) will vary within the geographic area and as such, the Contractor shall determine, based on the conditions, where and when DLA shall be applied. For example, conditions may be that DLA is required on:

- all driveway and parking lot areas
- driveways only
- facilities within a specific geographic area

#### **7.9.1.2 Pre-wetting**

Pre-wetting is an application method in which a concentrated liquid anti-icing product is added to dry solid salt just before it is applied to the surface of the roadway. The liquid can be added either at the chute or at the spinner. Pre-wetting has been demonstrated to increase the effectiveness of dry road

salt, reducing the amount of salt required. The liquid helps the salt stick to the pavement and facilitates melting by speeding the reaction time of dry salt. Pre-wetting should be used where weather and/or road conditions warrant.

### 7.9.2 Application Rates

The rate of materials application depends on a variety of factors, including the weather conditions, surface temperature trend, existing snow or ice cover, traffic volume, and the type of material being applied. The Contract Administrator and the Contractor will determine and agree on application rates for different weather and roadway conditions.

Application rates for parking lots are currently being developed by the University of Waterloo in partnership with Landscape Ontario, TRCA and several other organizations. When complete, they can be found at [www.sicops.ca](http://www.sicops.ca).

Examples of parking lot application rates that are currently in use in different jurisdictions can be found in Appendix 1.

#### **[Option 1: Contractor Responsible For Timing and Quantity of Materials Application]**

As part of the Fixed Price Work, the Contractor shall at its sole discretion determine when and in what quantities Ice Melting Products are to be applied to the Premises in accordance with the Drawings and Specifications. In determining whether or not and how to apply Ice Melting Products in any particular circumstance, the Contractor shall act reasonably, shall monitor the weather in the vicinity of the Premises and shall apply the standards of the custom of the snow and ice maintenance industry.

#### **[Option 2: Contract Administrator Responsible For Timing and Quantity of Materials Application]**

The Contract Administrator shall at its sole discretion determine if it wishes to have Salt, Sand, Calcium, or **[name any other products used on site]** (the “Ice Melting Products”) applied at the Premises. The Contract Administrator may request that Ice Melting Products be applied by **[describe how Contract Administrator is to contact Contractor to request applications]** and upon receiving a request to apply Ice Melting Products, the Contractor shall respond to the request within a commercially reasonable period of time.

### 7.9.3 Snow Clearing

Mechanical removal of snow is a key measure for salt conservation. By removing as much snow as possible through plowing, less salt is required to keep the roadway free of snow and ice. The potential for refreeze is also minimized, as less snow and ice is available to dilute the applied chemical.

The following items should be reviewed with all staff engaged in winter maintenance to ensure that care and caution is exercised during the following plowing operations:

- a. Drainage structures-catch basins, manholes, etc.

- b. Fire hydrants, valve chambers
- c. Hydro, telephone and other above and below ground services
- d. Around delineators, median markers, signposts, mail boxes, etc.
- e. Gates, bollards, fencing
- f. Turning and auxiliary lanes
- g. On-street parking areas
- h. Operating, services and delivery vehicles on site

#### 7.9.4 Snow Storage and Removal

##### [Option 1: Snow Storage Permitted On-Site]

If cleared snow is stored on-site, it should be located down-slope from any on-site salt and sand storage. Snow melt should never flow through the salt or sand storage area.

Snow and ice removed will be taken immediately to a site designated by the Contract Administrator within a radius of **[five (5)]** kilometres of the parking facility.

##### [Option 2: Snow Storage Not Permitted On-Site]

Snow and ice removed will be taken immediately to a site designated by the Contract Administrator within a radius of **[five (5)]** kilometres of the parking facility. No temporary storage of snow will be permitted anywhere on any lot. The Contract Administrator can provide a suitable location for this, should the Contractor not have access to a facility.

#### 7.10 Monitoring and Record Keeping

Good record keeping is essential for minimizing contractor liability and for optimizing winter maintenance practices. By monitoring the effectiveness of different materials and application rates in relation to pavement and weather conditions, areas for improvement can be identified. Tracking salt use also allows the Contractor's progress in the implementation of BMPs to be more accurately assessed.

The Contractor shall keep and maintain detailed records to track the times service was delivered and upon request, provide this detailed information to the Contract Administrator. It is advised/required that Contractors deploy GPS technology in conjunction with electronic spreader controllers to provide this tracking.

Monitoring and record keeping **[should/must]** include:

- Location
- Date and time of treatment
- Weather conditions
  - Type of precipitation

- Air temperature
- Pavement conditions
  - Extent of snow/ice cover
  - Pavement temperature trends
- Plowing activities
- Type and quantity of material placed
- Snow removal activities
  - Amount removed
  - Disposal location
- Observed risk areas that could not be treated and why they could not be treated

A template for documenting winter maintenance activities can be found in Section 9.

In addition to winter maintenance activities, the following should also be tracked:

- Fleet characteristics
  - Percentage equipped with electronic spreader controllers
  - Percentage equipped with pre-wetting
  - Percentage equipped with DLA
  - Percentage calibrated annually
- Staff training

## **8 ROUTES AND FACILITIES**

**[Drawings or plans of each parking facility should be attached here. Areas where snow and ice control materials are to be applied, where snow clearing is to occur, and where snow is to be stored should be clearly marked on the site map. Salt vulnerable areas such as wetlands or other sensitive terrestrial environments should also be marked on the site map.]**

## 9 SAMPLE ACTIVITY LOG

This activity log can be used to accurately measure winter maintenances activities and monitor the implementation of best practices. **[Tailor as needed according to circumstances.]**

<b>RECORD OF WINTER MAINTENANCE</b>	
<b>General</b>	
Location	
Treatment start date and time	
Treatment end date and time	
Name of operator	
<b>Weather conditions</b>	
Air temperature	
Relative humidity (%)	
Dew point	
Sky (Ex: sunny, cloudy, etc.)	
Date and time of event start	
Date and time of event end	
Type of precipitation (Circle all that apply)	Snow / Rain / Snow / Freezing rain / Sleet / Hail / Other:
Total precipitation (mm)	
<b>Pavement conditions</b>	
Extent of snow/ice cover	
Pavement temperature trend	
<b>Maintenance activities</b>	
Timing of application	Anti-icing / De-icing
Type of material applied	
Reason for applying	
Application rate	
Describe snow clearing activities	

Amount of snow removed	
Disposal location	
<b>Areas of special concern</b>	
Observed risk areas that could not be treated	
Reasons for not treating risk areas	
<b>Observations</b>	
Observations at the time of treatment	
Observations during the event	
Observations after the event	

Source: Minnesota Pollution Control Agency. 2010 Revised Edition. Winter Parking Lot and Sidewalk Maintenance Manual.

**10 LIST OF EQUIPMENT**

Contractors submitting Tenders must submit a list of equipment capacity and size that can be inspected prior to award.

**[Require that a certain percentage of the fleet be equipped with anti-icing and/or pre-wetting equipment, if applicable.]**

**Table 4:** List of Equipment

**[Option 1:]**

<b>Type</b> (Loader, truck, etc.)	<b>Size</b>	<b>Description</b>

[Option 2:]

Equipment by unit number	PATROL	TRUCK			WINTER EQUIPMENT					NEW TECHNOLOGIES					OTHER				
	Winter pick-up	Tandem	Tri Axle	Single Axle	Plow	Wing	Combination unit	Spreader	Spinner (Single/Dual)	Electronic controller	Calibration	Pre-wet equip	Anti-icing equip	Anti-icing unit capacity (L)	Infrared thermometers	Loader	Loader weigh bucket	Grader	Sidewalk equip.
<b>PATROL YARD #1</b>																			
<b>PATROL YARD #2</b>																			

For each patrol yard, list all the equipment including hired or contracted units by unit number and indicate 'Y' for YES in the appropriate box for the equipment making up that unit. If not applicable, then leave box blank.

Location for equipment viewing (if required):

Date:

Time:

## 11 LIST OF PROPOSED SUB-CONTRACTORS

To be completed and returned with Tender.

<b>LIST OF PROPOSED SUB-CONTRACTORS</b>			
<b>Sub-Trade</b>	<b>Name of Proposed Sub-Contractor</b>	<b>Address of Sub-Contractor</b>	<b>Phone Number of Sub-Contractor</b>

**12 TENDERER’S EXPERIENCE IN SIMILAR WORK**

To be completed and returned with Tender.

<b>TENDERER'S EXPERIENCE IN SIMILAR WORK</b>				
<b>Year Completed</b>	<b>Description of Work</b>	<b>Value</b>	<b>For Whom Work Performed</b>	<b>Phone Number</b>

### 13 TENDERER'S SENIOR STAFF

To be completed and returned with Tender. Attach resumes describing qualifications and work experience if desired.

LIST OF TENDERER'S SENIOR STAFF TO BE EMPLOYED ON THIS CONTRACT		
Name	Position	Qualifications/Experience

## 14 FORM OF TENDER

[Name of municipality or organization]

[Year] to [Year] Tender for Winter Maintenance Services

### Form of Tender

#### [Option 1: Unit Price per Event ]

I/We the undersigned agree to fulfill the requirements set out in this document for the Winter Maintenance Services. I/We have carefully examined the various Sites and Site Conditions, Specifications, Tender Documents, and Addenda No. [X] to [X], relating to this Contract. We agree to provide this service within the time specified and in failure to so agree to pay [name of municipality or organization] [two thousand dollars (\$2,000)] per Calendar day in Liquidated Damages, and forfeit our monthly standby costs.

Tender Quantities are estimated based on previous years for the purpose of indicating the magnitude of work to be completed. Payment will be at the unit prices tendered for the actual amount of snow accumulation based on observed weather recordings from Environment Canada weather stations at the [List the locations of the weather station(s) closest to the parking facilities], less any property damages and liquidated damages.

Item	Estimated Quantity	Price per Event	Total
Training costs including wages, travel expenses and course registration for staff members to attend and successfully complete the Smart About Salt Training in Milton or Cambridge.	4	\$	\$
Monthly Standby costs, inclusive of all equipment leases, labour arrangements and insurance to provide the service.	4	\$	\$
Provide winter maintenance for all winter events from a frost and black ice event up to 1 centimeter of snow accumulation, including removal of snow drifts.	20	\$	\$
Provide winter maintenance for all winter events from 1 centimeter of snow accumulation event up to 15 centimeters of snow accumulation.	15	\$	\$
Provide winter maintenance for all winter events greater than 15 centimeters of snow accumulation.	2	\$	\$
Provide winter maintenance for a freezing rain event.	1	\$	\$
		<b>H.S.T.</b>	\$
		<b>Total Tendered</b>	\$
<b>Percent annual increase (for optional up to two year extension)</b>			

**[Option 2: Lump Sum per Season]**

I/We, the undersigned, having examined the Instructions to Contractors & General Conditions, Scope of Work, the Form of Tender, and having attended the information meeting, do hereby offer and agree to enter into an agreement with **[name of municipality or organization]**, to supply all labour and equipment necessary for Winter Maintenance, at the following locations, as follows:

**Fixed Price Work**

**[The Level of Service can be removed from this table if using a single Level of Service for all parking facilities. Add more rows as required.]**

	Parking Facility	Level of Service	Price per Season: (Materials Application)	Price per Season: (Snow Plowing)
1.	Facility name and address		\$	\$
	Contact name and phone number			
2.			\$	\$
3.			\$	\$
4.			\$	\$
5.			\$	\$
<b>H.S.T.</b>			\$	\$
<b>Total Tendered</b>			\$	\$
<b>Grand Total</b>			\$	
<b>Percent annual increase (for optional up to two year extension)</b>				

**Additional Work**

**[This section is only applicable if the number of snowfalls included in the Fixed Price Work is capped.]**

Snow Clearing for the first [X] Snowfalls is included as part of the Fixed Price Work, after which the Contractor will be paid for each additional Snowfall, as Additional Work, the following sum not including applicable taxes.

	Parking Facility	Price per Additional Snowfall: (Materials Application)	Price per Additional Snowfall: (Snow Plowing)
1.	Facility name and address	\$	\$
	Contact name and phone number		
2.		\$	\$
3.		\$	\$
4.		\$	\$
5.		\$	\$

**Extra Work**

Extra Work, including Snow Relocation and Snow Removal is tendered as follows:

**[Modify the items in the table below as needed.]**

Activity	Price
Worker Engaged in Snow Shovelling	\$ per hour
Skid Steer Tractor/Loader with Operator	\$ per hour
5 Ton Dump Truck with Operator	\$ per hour
1 Yd Tractor/Loader with Operator	\$ per hour
¾ -1 Ton Truck with Plow and Operator	\$ per hour
5 Yd Tractor/Loader with Operator	\$ per hour
Tandem Dump Truck with Operator	\$ per hour
Tri Axle Dump Truck with Operator	\$ per hour
Tipping fees associated with Snow Removal	Actual Cost, plus 10%
Mileage associated with Snow Removal	\$ per km

**Addendum/Addenda** (If applicable must be filled in by Contractor.)

I/We, the undersigned, acknowledge that I/We have received addendum/addenda Numbers \_\_\_\_\_\* to \_\_\_\_\_\* inclusive, and that all changes specified therein have been included in the prices submitted.

## 15 FORM OF IRREVOCABLE OFFER

I hereby offer to provide the requirements under RFP # [X] to [name of municipality or organization] according to the terms as set out in the RFP including the requirement for and acceptance by a formal contract acceptable to [name of municipality or organization]. I also agree that this irrevocable offer shall be open to acceptance by [name of municipality or organization] for a period of [X] days from the closing date for the receipt of proposals.

Witness: \_\_\_\_\_

Signed: \_\_\_\_\_

OR

Name: \_\_\_\_\_

(Affix Company Seal if applicable)

Title: \_\_\_\_\_

Vendor Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/Province: \_\_\_\_\_

Postal Code: \_\_\_\_\_

Telephone (Day): \_\_\_\_\_

Telephone (After Hours): \_\_\_\_\_

Fax: \_\_\_\_\_

Email Address: \_\_\_\_\_

H.S.T. Business Number: \_\_\_\_\_

Workplace Safety and Insurance Board (W.S.I.B.)

Account Number: \_\_\_\_\_

1. Lowest or any bid not necessarily accepted.
2. Total Tendered Price noted is inclusive of all applicable taxes.
3. Price Tendered is inclusive of all transport, freight charges, handling charges, etc.

## 16 RECEIPT CONFIRMATION FORM

**[Name of municipality or organization]**

**Request for Tender No. [####]**

**Parking Lot Snow Clearing & Ice Control Services**

Closing Date & Time: Prior to **[Date and time]**

For any further distributed information about this Request for Tender, please return this form by fax or email as soon as possible to:

**[Name and job title of contact person]**

Email: **[email address of contact person]**

Fax: **[Fax number]**

Company Name: \_\_\_\_\_

Street Address: \_\_\_\_\_

City/Province: \_\_\_\_\_

Postal Code: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Title: \_\_\_\_\_

Email Address: \_\_\_\_\_

Contractors: Please note all subsequent information will also be posted on the **[name of website, if applicable]** website. **[Name of municipality or organization]** will attempt to send information directly to those Contractors that have returned this form, but it is the responsibility of the Contractors to ensure that all information has been received.

## APPENDIX 1: SAMPLE APPLICATION RATES

Road salt application rates currently used by other jurisdictions within and outside of Ontario are presented below. These rates have been provided for guidance only, and are not a requirement. The effectiveness of a given application rate is dependent on several factors including precipitation type and depth, air and pavement temperature, humidity, dew point, sun exposure, the type of paved surface, and the volume of traffic. These application rates should be modified according to the conditions observed at the parking lot and the knowledge and experience of the contractor.

### Anti-Icing

Tables 5 and 6 present application rate guidance for anti-icing using liquids, developed by the Minnesota Pollution Control Agency and the Niagara Region. Application rates vary based on the type of precipitation and the type of liquid being applied.

**Table 5:** Direct Liquid Application (DLA) Guidelines (L/100 m<sup>2</sup>)

CONDITION	APPLICATION RATE (L/100 m <sup>2</sup> )		
	MgCl <sub>2</sub>	Salt Brine (NaCl)	Other Products
Minnesota			
Regularly scheduled applications	0.8 – 1.6	1.2 – 2.4	Follow manufacturers' recommendations
Prior to frost or black ice event	0.8 – 1.6	1.2 – 2.4	
Prior to light or moderate snow	0.8 – 1.6	1.2 – 3.3	
Niagara Region			
Prior to frost	N/A	1.71 – 2.28*	N/A
Prior to snow or freezing rain**	N/A	2.28 – 3.5*	N/A
<b>CAUTION: Too high an application rate may result in slippery conditions or tracking.</b>			

\*Spread the liquid across 2/3 of the driving surface.

\*\*Liquid anti-icing in anticipation of snow and/or freezing rain should be completed as close to the beginning of the precipitation as possible to a maximum of eight (8) hours.

**Table 6:** Direct Liquid Application (DLA) Guidelines (gallons/1,000 ft<sup>2</sup>)

CONDITION	APPLICATION RATE (gallons/1,000 ft <sup>2</sup> )		
	MgCl <sub>2</sub>	Salt Brine (NaCl)	Other Products
Minnesota			
Regularly scheduled applications	0.2 – 0.4	0.3 – 0.6	Follow manufacturers' recommendations
Prior to frost or black ice event	0.2 – 0.4	0.3 – 0.6	
Prior to light or moderate snow	0.2 – 0.4	0.3 – 0.8	
Niagara Region			
Prior to frost	N/A	0.4 – 0.6*	N/A
Prior to snow or freezing rain**	N/A	0.6 – 0.9*	N/A
<b>CAUTION: Too high an application rate may result in slippery conditions or tracking.</b>			

\*Spread the liquid across 2/3 of the driving surface.

\*\*Liquid anti-icing in anticipation of snow and/or freezing rain should be completed as close to the beginning of the precipitation as possible to a maximum of eight (8) hours.

The DLA for frost shall not be completed if any of the following criteria are expected:

- Pavement temperature is expected to remain above 2° centigrade continuously for the next 72 hours
- Pavement temperature is lower than -10° centigrade during the application
- Pavement temperature is expected to fall below -15° centigrade at any time within the next 24 hours
- Non-freezing rain is forecast in the next 24 hours
- Snow or ice has already accumulated on the road surface

The DLA in anticipation of snow and/or freezing rain shall not be applied if:

- The pavement temperature is lower than -10° centigrade or is expected to be below -10° centigrade between the time of application and the start of precipitation
- Snow and/or ice has already accumulated on the road surface

## Deicing

Table 7 presents application rate guidance used in the Niagara Region for varying weather and pavement conditions. Pre-wetted salt is to be applied in such a way as to ensure the maximum amount of material remains on the road. This is usually accomplished by applying a strip not less than 3.5 m wide, down the centre of a two-lane driveway or laneway and between lanes in a parking area at the rates shown in Table 7. Where pre-wetting equipment is unavailable, dry salt may be used at the rate of 1.85 – 2.42 kg/100 m<sup>2</sup> (3.8 – 5.0 lbs/1,000 ft<sup>2</sup>). On elevated sections of driveway and parking areas, the salt shall be kept as high up on the pavement as possible to allow the brine to flow across the driveway or parking area.

Salt is spread after the beginning of precipitation when moisture is present to hold the salt in place.

The spinner shall be used to apply pre-wet salt on pavements with:

- surfaces made of open friction course material; or
- distorted cross fall; or
- no cross fall.

In these situations, the brine cannot flow across the pavement, and consequently a narrow strip will not be effective. Under freezing rain conditions, spread over 1/3 of the driving surface.

The recommended application rates are based on on-board pre-wetting with liquid applied at a minimum of 5% and maximum of 30% by mass of the dry material rate, where the total dry equivalent of liquid and dry rock salt is equal to the rates shown in Table 7.

“Light snow” refers to snowfall where plowing operations are not yet necessary (or anticipated), but there is a need to apply salt. “Heavy snow” refers to snowfall where plowing will be required during the storm event.

**The variable application rates are a guideline only. Where these rates are not achieving the required results, re-application, or increasing rates to the standard (1.85 – 2.42 kg/100 m<sup>2</sup>) shall be considered.**

When using the variable chart, ensure consideration is given to weather forecasts, pavement conditions, and pavement temperatures. Use relevant information from RWIS, and infrared thermometers and visual assessment.

**Specific attention shall be given to potentially hazardous locations, such as: hills and run-off areas, curves, intersections, and shaded areas. These locations are potentially hazardous because they could be slippery when the rest of the surface area is not, or they are areas which may require braking.**

**Table 7:** Best Practices for Variable Salt Application Rates with On-Board Pre-Wetting

Precipitation	Units	Road Surface Temperature Range		
		Warmer than -5°C	-5°C to -10°C	-10°C to -18°C
Frost	kg/100 m <sup>2</sup>	0.7	1.0	1.0
	lbs/1,000 ft <sup>2</sup>	1.4	2.0	2.0
Light snow	kg/100 m <sup>2</sup>	1.0	1.43	1.85
	lbs/1,000 ft <sup>2</sup>	2.0	2.9	3.8
Heavy snow	kg/100 m <sup>2</sup>	1.85	1.85	2.42
	lbs/1,000 ft <sup>2</sup>	3.8	3.8	5.0
Freezing rain	kg/100 m <sup>2</sup>	1.85	2.42	2.42
	lbs/1,000 ft <sup>2</sup>	3.8	5.0	5.0

Tables 8 and 9 contain guidelines for parking lot application rates from the Minnesota Pollution Control Agency’s Winter Parking Lot and Sidewalk Maintenance Manual. These rates are based on road application guidelines (Mn Snow & Ice Control Field Handbook, Manual 2005-1). Develop your own

application rates by adjusting your current rates incrementally downward toward these guidelines. Where temperature categories overlap, select the rate most applicable to your situation.

**Table 8:** Deicing Application Rate Guidelines for Parking Lots and Sidewalks (kg/100 m<sup>2</sup>)

Pavement Temp (°C) and Trend (↑ ↓)	Weather Condition	Maintenance Actions	Application Rate in kg/100 m <sup>2</sup>			
			Salt Prewetted/ Pretreated with Salt Brine	Salt Prewetted/ Pretreated with Other Blends	Dry Salt	Winter Sand (abrasives)
> -1° ↑	Snow	Plow, treat intersections only	0.37	0.24	0.37	Not recommended
	Freezing rain	Apply chemical	0.61	0.49	0.73	Not recommended
-1° ↓	Snow	Plow and apply chemical	0.61	0.49	0.73	Not recommended
	Freezing rain	Apply chemical	0.73	0.61	0.85	Not recommended
-1° to -4° ↑	Snow	Plow and apply chemical	0.61	0.49	0.73	Not recommended
	Freezing rain	Apply chemical	0.73	0.61	0.85	Not recommended
-1° to -4° ↓	Snow	Plow and apply chemical	0.61	0.49	0.73	Not recommended
	Freezing rain	Apply chemical	0.85	0.73	1.10	1.59
-4° to -7° ↑	Snow or freezing rain	Plow and apply chemical	0.85	0.73	1.10	1.59 for freezing rain
-4° to -7° ↓	Snow	Plow and apply chemical	0.98	0.98	1.34	Not recommended
	Freezing rain	Apply chemical	1.22	0.98	1.46	1.59
-7° to -9° ↑	Snow	Plow and apply chemical	0.98	0.98	1.34	Not recommended
	Freezing rain	Apply chemical	1.22	0.98	1.46	1.59
-7° to -9° ↓	Snow or freezing rain	Plow and apply chemical	1.22	0.98	1.46	1.59 for freezing rain
-9° to -18° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	1.46	Not recommended	2.44 spot treat as needed
<-18°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	2.20	Not recommended	2.44 spot treat as needed

**Table 9:** Deicing Application Rate Guidelines for Parking Lots and Sidewalks (lbs/1,000 ft<sup>2</sup>)

Pavement Temp (°C) and Trend (↑ ↓)	Weather Condition	Maintenance Actions	Application Rate in lbs/1,000 ft <sup>2</sup>			
			Salt Prewetted/ Pretreated with Salt Brine	Salt Prewetted/ Pretreated with Other Blends	Dry Salt	Winter Sand (abrasives)
> -1° ↑	Snow	Plow, treat intersections only	0.75	0.5	0.75	Not recommended
	Freezing rain	Apply chemical	1.25	1.0	1.5	Not recommended
-1° ↓	Snow	Plow and apply chemical	1.25	1.0	1.5	Not recommended
	Freezing rain	Apply chemical	1.5	1.25	1.75	Not recommended
-1° to -4° ↑	Snow	Plow and apply chemical	1.25	1.0	1.5	Not recommended
	Freezing rain	Apply chemical	1.5	1.25	1.75	Not recommended
-1° to -4° ↓	Snow	Plow and apply chemical	1.25	1.0	1.5	Not recommended
	Freezing rain	Apply chemical	1.75	1.5	2.25	3.25
-4° to -7° ↑	Snow or freezing rain	Plow and apply chemical	1.75	1.5	2.25	3.25 for freezing rain
-4° to -7° ↓	Snow	Plow and apply chemical	2.0	2.0	2.75	Not recommended
	Freezing rain	Apply chemical	2.5	2.0	3.0	3.25
-7° to -9° ↑	Snow	Plow and apply chemical	2.0	2.0	2.75	Not recommended
	Freezing rain	Apply chemical	2.5	2.0	3.0	3.25
-7° to -9° ↓	Snow or freezing rain	Plow and apply chemical	2.5	2.0	3.0	3.25 for freezing rain
-9° to -18° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	3.0	Not recommended	5.0 spot treat as needed
<-18°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	4.5	Not recommended	5.0 spot treat as needed

The Ministry of Transportation Ontario (MTO) salt application rates for roadways, converted to units relevant for parking lots, are provided in Table 10. Research has shown that application rates for parking lots are usually higher than the MTO rates for roads.

**Table 10:** Ministry of Transportation Ontario (MTO) Deicing Application Rates for Roads

	<b>Units</b>	<b>Dry Salt Application Rate</b>
Low	kg/100 m <sup>2</sup>	1.70
	lbs/1,000 ft <sup>2</sup>	3.5
Medium	kg/100 m <sup>2</sup>	1.96
	lbs/1,000 ft <sup>2</sup>	4.0
High	kg/100 m <sup>2</sup>	2.22
	lbs/1,000 ft <sup>2</sup>	4.5

## **ADDITIONAL APPENDICES**

**Appendices may include:**

- **Site and Facility Plans, Photographs, Diagrams**
- **Existing Reports, Studies, and Information**
- **Purchasing Policies**
- **Warranty**
- **Contract Form/Form of Agreement**
- **Certificate of Insurance**
- **Code of Conduct**
- **Certificate of Compliance with Health and Safety**