

TENDER DOCUMENTS

SUBSECTION 6.94 SNOW REMOVAL AND SPREADING AND SUPPLY OF DE-ICING SALTS AND ABRASIVES

TABLE OF CONTENTS

	PAGE
SUBSECTION 6.94 SNOW REMOVAL AND SPREADING AND SUPPLY OF DE-ICING SALTS AND ABRASIVES	1
6.94.1 GENERAL.....	1
6.94.2 MEASUREMENT UNITS.....	1
6.94.3 REFERENCE STANDARDS	1
6.94.4 MATERIALS	2
6.94.5 INSPECTION AND STORAGE	4
6.94.6 EQUIPMENT	5
6.94.7 EXECUTION OF WORK	6
 APPENDIX 6.94-I SPREADING CHART	

SUBSECTION 6.94 SNOW REMOVAL AND SPREADING AND SUPPLY OF DE-ICING SALTS AND ABRASIVES

6.94.1 GENERAL

6.94.1.1 This subsection describes the requirements relating to the snow removal and spreading work and to the supply of de-icing salts and abrasives covered by this Contract.

6.94.2 MEASUREMENT UNITS

6.94.2.1 The measurement units and respective symbols thereof used in this subsection are described as follows:

Measurement Unit	Designation	Symbol
length	meter	m
length	centimeter	cm
length	kilometer	km
volume	cubic meter	m ³
mass	kilogram	kg
mass	ton	t
time	hour	h
temperature	Celsius degree	°C

6.94.3 REFERENCE STANDARDS

6.94.3.1 The Contractor shall carry out all snow removal and spreading work and supply the de-icing salts and abrasives in accordance with the requirements of the following standards and documents, to which the provisions of this Contract are added:

6.94.3.1.1 (ASTM) American society for testing and materials:

- ASTM E534 – *Standard Test Methods for Chemical Analysis of Sodium Chloride*;
- ASTM D632 - *Standard Specification for Sodium Chloride*.

6.94.3.1.2 (MTQ) Ministère des Transports du Québec:

- MTQ – *Cahier des charges et devis généraux (CCDG) – Déneigement et déglacage*;
- MTQ – *Normes – Ouvrages Routiers – Tome VI Entretien, Norme 6101 Niveaux de service*;
- MTQ – *Normes – Ouvrages Routiers – Tome VI Entretien, Norme 6103 Déneigement des routes sans réserve de capacité*;
- MTQ – *Normes – Ouvrages Routiers – Tome VI Entretien, Norme 6104 Déglacage avec fondants et abrasifs des routes avec réserve de capacité*;

- MTQ – Normes – Ouvrages Routiers – Tome VI Entretien, Norme 6105 *Déglacage avec fondants et abrasifs des routes sans réserve de capacité*;
- MTQ – Normes – Ouvrages Routiers – Tome VI Entretien, Norme 6106 *Déglacage mécanique*;
- MTQ – Normes – Ouvrages Routiers – Tome VII Matériaux, Norme 12101 *Chlorure de sodium*;
- MTQ – Normes – Ouvrages Routiers – Tome VII Matériaux, Norme 12102 *Chlorure de calcium*;
- MTQ – Normes – Ouvrages Routiers – Tome VII Matériaux, Norme 14401 *Abrasifs*.

6.94.4 MATERIALS

6.94.4.1 The Contractor shall supply all spreading materials for the performance of the work under this Contract.

6.94.4.2 The materials shall be used exclusively for the purposes of this Contract.

6.94.4.3 DE-ICING SALT

6.94.4.3.1 The de-icing salt shall be sodium chloride (NaCl).

6.94.4.3.2 The Contractor is required to supply directly from a de-icing salt supplier. The equipment shall comply with MTQ standard 12101.

6.94.4.3.3 The de-icing salt shall be free of gravel, clay, ore and any foreign matter liable to promote caking or lump formation.

6.94.4.3.4 The de-icing salt shall be treated with anti-caking admixtures so as to maintain the workability in cold weather.

6.94.4.3.4.1 The admixtures used as anti-caking agents shall not significantly alter the properties of the sodium chloride and shall not be harmful to the environment. Furthermore, they shall not reduce the road-gripping traction.

6.94.4.4 ABRASIVES

6.94.4.4.1 The abrasives shall comply with MTQ standard 14401.

6.94.4.4.2 The abrasives shall consist of crushed stone.

6.94.4.4.2.1 The crushed stone used shall comply with the AB-5 grading requirements of Table 14401-1 of MTQ standard 14401.

- 6.94.4.4.3 Treatment of the abrasives
- 6.94.4.4.3.1 To ensure a good workability of the abrasives in cold weather and to facilitate the loading and spreading thereof, they shall be treated with calcium chloride (CaCl₂).
- 6.94.4.4.3.2 Calcium chloride shall be added to the crushed stone at the rate of 1 to 2 % by weight.
- 6.94.4.4.3.3 The treatment of the abrasives shall not be carried out in rainy conditions.
- 6.94.4.4.4 Calcium chloride shall be added to the abrasives used at temperatures below -18°C, in accordance with the spreading chart contained in Appendix 6.94-I *Spreading Chart* of this subsection.
- 6.94.4.5 The Contractor shall send to the Owner a copy of the weigh bills or delivery slips of the materials within forty-eight (48) hours of their reception.
- 6.94.4.6 In order to be able to carry out proper spreading, the Contractor shall ensure that it has in stockpile, at the beginning of each season, and shall ensure to maintain, throughout the season, 300 t of de-icing salt, 150 t of crushed stone and a sufficient quantity of calcium chloride to ensure, at all times, a safe roadway for users.
- 6.94.4.7 TECHNICAL DATA SHEETS
- 6.94.4.7.1 The Contractor is responsible for providing the technical data sheets of the abrasives whose intrinsic and complementary properties relating to the aggregate meet CCDG's AB-5 requirements of MTQ.
- 6.94.4.8 CERTIFICATE OF CONFORMITY
- 6.94.4.8.1 The Contractor is responsible for providing the Engineer, at least fourteen (14) days prior to the beginning of each winter season, with a certificate of conformity of the abrasives that will be used for the work covered by this subsection.
- 6.94.4.8.2 The certificate of conformity shall contain the following information:
- 6.94.4.8.2.1 the name of the supplier;
- 6.94.4.8.2.2 the date and place of manufacture;
- 6.94.4.8.2.3 the results of the sieve testing;
- 6.94.4.8.2.4 the results of the water content tests;
- 6.94.4.8.2.5 the type of admixture;
- 6.94.4.8.2.6 the admixture's percentage by weight of abrasive.

6.94.4.9 WINDBREAK FENCE

6.94.4.9.1 The Contractor shall supply and install windbreak (snow) fences indicated on the plans, to prevent, as much as possible, drifts from accumulating in the traffic lanes. These windbreak fences shall be removed at the end of each winter season.

6.94.5 INSPECTION AND STORAGE

6.94.5.1 STORAGE SITE

6.94.5.1.1 The Contractor shall have a materials storage site located within a maximum radius of 5 km of the boundaries of the territory covered by this Contract. The Contractor may use, as storage site, a portion of the snow storage facility or of the land adjacent to the garage described below.

6.94.5.1.2 The Contractor's storage site shall comply with the current standards and regulations and shall be watertight and equipped with a canvas and walls to protect it against adverse weather conditions and precipitation. In addition, the site shall rest on an impervious surface (asphalt, concrete or other equivalent material) to prevent the brine from infiltrating into the ground.

6.94.5.1.3 The Engineer may visit the Contractor's materials storage site without notice.

6.94.5.2 GARAGE

6.94.5.2.1 The Owner will provide the Contractor with an unheated garage, hereinafter called "Garage", whose location will be provided by the Owner.

6.94.5.2.2 The Contractor shall provide, at the beginning of each season, and maintain in the Garage, at all times throughout the season, all the equipment necessary to carry out the snow removal and spreading work required in this Contract, which equipment shall be kept functional at all times.

6.94.5.2.3 The Garage shall be maintained in good condition by the Contractor. At the end of each winter season during the term of the present Contract, the Contractor shall return the Garage to the Owner in the same condition as it was when the Contractor took it at the beginning of the season.

6.94.5.2.4 The Engineer may, at any time, visit the Contractor's Garage to ensure that the requirements of the Contract, including the requirements of paragraph 6.94.5.2.3, are met.

6.94.5.3 SNOW STORAGE FACILITY

6.94.5.3.1 The location of the snow storage facility made available to the Contractor will be determined by the Owner.

6.94.6 EQUIPMENT

- 6.94.6.1 The Contractor shall use all the vehicles and equipment that will be necessary to carry out the work covered by this Contract and to complete it on time.
- 6.94.6.2 The Contractor shall use the proper equipment, of sufficient capacity and in sufficient numbers to enable it to carry out the work in accordance with the requirements of this subsection. This equipment shall be in good working order and safe for both the workers and the public, in accordance with the current applicable laws and regulations.
- 6.94.6.3 For each piece of equipment used to carry out the work covered by this Contract, the Contractor shall provide the Engineer with a statement of mechanical conformity issued in the last sixty (60) days.
- 6.94.6.4 The Contractor shall own vehicles and equipment meeting the following minimum characteristics and provide with its tender the registration certificates thereof:
- 6.94.6.4.1 one (1) snow blower, having a minimum capacity of 2,180 t/h;
- 6.94.6.4.2 four (4) 10-wheel 9 m³ spreader trucks, with reversible snowplough giving a trace of at least 3.65 m and a 3.65 m side wing, 2005 or newer model and in good condition;
- 6.94.6.4.3 one (1) 10-wheel 9 m³ spreader truck, with reversible snowplough giving a trace of at least 3.65 m, fitted with a quick coupler, 2005 or newer model and in good condition. This equipment will be used for snow removal and spreading of de-icing salt and abrasives on the dedicated lane;
- 6.94.6.4.4 one (1) road grader equipped with a 4.30 m blade, 2000 or newer model and in good condition;
- 6.94.6.4.5 one (1) wheel loader having a minimum capacity of 2.2 m³, fitted with a quick coupler for 3.65 m reversible plow, 2000 or newer model and in good condition.
- 6.94.6.5 If, at the time of filing its tender, the Contractor does not own the required vehicles and equipment, the Contractor may append to the tender form a conditional promise to purchase duly signed by the supplier from whom it intends to acquire the required vehicles and equipment.
- 6.94.6.6 The Contractor shall, at no cost to the Owner, have the equipment required to follow the movement of the vehicles according to the GPS technology (satellite positioning) installed on the vehicles used for the purposes of the present Contract. The Contractor hereby consents to the Owner checking the movement of its vehicles on the road network.

- 6.94.6.7 The spreader trucks shall be equipped with electronic controllers to effectively control a variety of spreading rates ranging between 0 and 500 kg per km for the abrasives and between 0 to 350 kg per km for the de-icing salt. The electronic controller shall be the product *CHLOROBITE* or equivalent authorized by the Owner.
- 6.94.6.7.1 The Contractor shall provide the Owner with a calibration certificate of its electronic controllers, for all its equipment used to carry out the work covered by the present Contract. The calibration shall be performed at the beginning of each season.
- 6.94.6.7.2 The Contractor shall further provide the Owner with a data converter to recover the electronic controller data for the purposes of payment of the spreading materials.
- 6.94.6.7.3 Signaling equipment
- 6.94.6.7.3.1 In order to secure the execution of the snow removal and de-icing work on the network covered by this Contract, the Contractor shall, during the contractual season, use signaling equipment that is specific to the vehicles and types of work to be carried out and maintain such equipment visible and operational.
- 6.94.6.7.3.2 The supply and maintenance of the signaling equipment shall be at the Contractor's expense.
- 6.94.6.7.3.3 The position, number and type of signaling equipment installed on each snow removal vehicle shall meet the requirements of Chapter 14 of CCDG of MTQ.

6.94.7 EXECUTION OF WORK

6.94.7.1 GENERAL

- 6.94.7.1.1 The Contractor is responsible for carrying out all the work and assumes, with regard thereto, an obligation of result. The Contractor shall lead and monitor the work efficiently. The Contractor is sole responsible for the means, methods, techniques, sequences, procedures and coordination of the work. No official notice will be given to the Contractor to start the snow removal and spreading operations.
- 6.94.7.1.2 The Contractor shall always organize its work programme taking into account the peak periods described in the *Table(s) of Lanes to be Maintained Open* provided by the Owner in such a way as to minimize traffic obstructions.
- 6.94.7.1.3 The Contractor shall comply with the written instructions issued by the Engineer.
- 6.94.7.1.4 The Contractor shall use the number of vehicles required to carry out the snow removal, spreading and all related work. The Contractor shall further distribute these vehicles efficiently and in compliance with this Contract to ensure a smooth and uninterrupted flow of traffic.

6.94.7.2 SPREADING WORK

- 6.94.7.2.1 The spreading work covered by this Contract consists in supplying and spreading de-icing salt and abrasives on all roadways indicated on the plans and determined by the Owner.
- 6.94.7.2.2 The Contractor shall, from the beginning of the precipitation as well as during and after the precipitation, as well as during episodes of blowing snow and until the end of operations, spread abrasives or de-icing salts on the roadway so as to maintain, at all times, a smooth and safe flow of vehicles.
- 6.94.7.2.3 The spreading work consists in, without however being limited to, the following:
- 6.94.7.2.3.1 Spreading de-icing salt on the roadway when the weather conditions including, without limitation, snowfalls, freezing rain, ice or blowing snow, make the roadway slippery, or as requested by the representatives of the Sûreté du Québec or by the Engineer.
- 6.94.7.2.3.1.1 When necessary, the Contractor may have to add calcium chloride to the de-icing salt or a mixture of crushed stone and calcium chloride for the spreading, taking into account the weather conditions.
- 6.94.7.2.3.1.1.1 A table is provided in Appendix 6.94-I *Spreading Chart* of this subsection for information purposes. The Contractor remains solely responsible for the type of materials to be spread on the basis of the weather conditions and the Owner disclaims any liability towards the Contractor in respect to the appendix, especially as to its accuracy.
- 6.94.7.2.4 The catch basins of the storm drainage system throughout the territory covered by this Contract shall be thawed by means of calcium chloride.
- 6.94.7.2.5 The Contractor shall load the different spreading materials in its spreader trucks by itself.

6.94.7.3 SNOW REMOVAL

- 6.94.7.3.1 The Contractor shall diligently patrol the entire territory. During such patrols, the Contractor shall plan its interventions and check the general condition of the territory, particularly in regard to road conditions, quality of the de-icing or need for spreading of materials and for snow removal or to the prevailing conditions at the critical locations.
- 6.94.7.3.2 The Contractor shall clear the snow after an accumulation of 2.5 cm from one (1) or more snowfalls.
- 6.94.7.3.3 The Contractor shall ensure that the snow removal is carried out on a continuous basis and over the full lane width. The Contractor shall carry out the snow removal in tandem or tridem so that no windrows that could jeopardize the safety of users are left on the roadway.

- 6.94.7.3.4 The Contractor shall, from the beginning of the precipitation, and during and after the precipitation or blowing snow and until the end of operations, clear the snow from the roadway in order to maintain, at all times, a smooth and safe flow of vehicles, pushing the snow from left to right and packing it as much as possible along the roadway, while avoiding throwing snow on the electric control boxes and on the signage panels and fences.
- 6.94.7.3.5 The Contractor shall, at all times, clear the snow from the catch basin grids so that they are free from any accumulation of snow or ice.
- 6.94.7.3.6 All the snow accumulated along the roadway and that could form what is commonly called a "launch pad" shall be completely cleared and treated as a priority.
- 6.94.7.3.7 The Contractor shall clear the snow from the roadway when the snow is pushed by gusting wind conditions and drifts accumulate on the roadway, even if the accumulation is less than the 2.5 cm referred to in paragraph 6.94.7.3.2, or even if there is no precipitation. The Contractor shall maintain the roadway clear of snow so as to ensure the smooth and safe flow of vehicles.
- 6.94.7.3.8 The snow removal and spreading shall be fully completed no later than four (4) hours after the end of the snowfall.
- 6.94.7.4 LOADING AND TRANSPORTATION
- 6.94.7.4.1 The loading consists in mechanically removing all snow accumulated along the roadway and on the roadway, and in transporting that snow to the snow storage facility determined by the Owner.
- 6.94.7.4.2 The Contractor shall proceed to the loading for accumulations from one or more snowfalls totaling more than 5 cm.
- 6.94.7.4.3 The Contractor shall not blow the snow onto and through the bridge superstructures.
- 6.94.7.4.3.1 The Contractor shall obtain authorization from the Owner to blow the snow on vacant land belonging to the Owner. Where obtained, this authorization will not relieve the Contractor from its responsibility for any damage arising from such operations.
- 6.94.7.4.4 Start of loading
- 6.94.7.4.4.1 The Contractor shall start the loading immediately after the end of the snowfall subject, however, to the *Table(s) of Lanes to be Maintained Open* provided by the Owner for this Contract.

6.94.7.4.5 End of loading

6.94.7.4.5.1 The loading shall be fully completed within the time limits described below:

6.94.7.4.5.1.1 For a precipitation of less than 20 cm, within forty-eight (48) hours after the end of the snowfall;

6.94.7.4.5.1.2 For a precipitation of more than 20 cm, within sixty (60) hours after the end of the snowfall.

6.94.7.4.5.2 The roadway shall be free of snow or ice when the loading is completed.

6.94.7.4.5.3 The time of the end of each snowfall will be determined by the Owner from the daily weather report sent by Environment and Climate Change Canada. The delays in carrying out the loading work are recognized from the time determined using this report.

6.94.7.5 FALLING MATERIALS

6.94.7.5.1 The Contractor shall take the necessary measures to prevent snow and ice from falling from viaducts or elevated sections of the bridge and approaches thereto, including the entrance and exit ramps.

END OF SUBSECTION

APPENDIX 6.94-I
SPREADING CHART
(1 PAGE)

SPREADING CHART
(as determined by the Contractor)

Temperature	Roadway Condition	Precipitation	Materials	Mixture	Spreading Rate Kg/Km
0 °C and above (temp. decreasing)	Wet	Snow/ice	Salt <i>if necessary</i>	N/A	175 to 200
0 °C and above (temp. increasing)	Wet	Snow/ice	Salt <i>if necessary</i>	N/A	175 to 200
0 °C to -5 °C (temp. decreasing)	Wet	Snow/ice	Salt <i>if necessary</i>	N/A	175 to 200
0 °C to -5 °C (temp. increasing)	Wet	Snow/ice	Salt <i>if necessary</i>	N/A	175 to 200
-5 °C to -10 °C	Wet or dry	Snow	Stone / Salt	1 stone / 1 salt (bucket)	200 to 225
Below -10 °C (from -12 °C to -18 °C)	Compacted or dry snow	None or snow	Stone / Salt	1 stone / 1 salt (bucket)	250 to 325
Below -18 °C	Dry (black ice)	None	Calcium / Stone / Salt	1 calcium (bag) / 2 stone / 2 salt	250 to 325
Below -25 °C	Dry (black ice)	None	Calcium / Stone <i>if necessary</i>	2 calcium (bag) / 1 stone	250 to 325