

CHAPTER IV - WINTER MAINTENANCE

1 HIGHWAY SNOW REMOVAL

1.A Maintenance Service

Highway snow removal will be performed by the Contractor as required on Highways to:

- (a) clear snow and remove ice build-up from Travelled Lanes or Shoulders; and
- (b) ensure Highways are kept smooth, safe and open to the travelling public; in accordance with this Maintenance Standard.

1.B Specifications

1.B.1 Performance Standard

- (a) ploughing will be performed to ensure that snow accumulations remain below the maximum allowable as set out in CHAPTER IV -1.C to the full width of the travelled lanes of the road surface within the response time (CHAPTER IV -1.C.1) consistent with the Highway Classification;
- (b) all loose snow and ice will be removed while ploughing such that pavement surfaces or compacted surfaces are exposed;
- (c) to apply this Standard, ploughing routes and priorities will be established and submitted to the District of Sooke; then prepare a timetable in consultation with the District of Sooke, local school districts and transit authority to ensure optimum bus service; and
- (d) compact snow and ice will be removed from paved Highway surfaces if requested by the District of Sooke, as set out in CHAPTER IV -1.C.1. The Contractor will be entitled to a payment in accordance with the terms of Part II of the Fee Schedule, or the District may elect to cause another Contractor to undertake the work.

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1.B.2 Miscellaneous

- (a) Plow speeds will be such that snow is thrown well off the Travelled Lanes, except in built-up areas where plow speeds will be adjusted to minimize inconvenience and prevent damage to persons and property;
- (b) if the temperatures are within the effective range of the De-Icing Chemical during and after ploughing of paved Highway surfaces, then spreading of De-Icing Chemicals will immediately follow ploughing. On all Highway surfaces if temperatures are below the effective range of the De-Icing Chemical being used, then Winter Abrasives will be applied as specified in the Maintenance Standard for Winter Abrasive and De-Icing Application;
- (c) the Contractor will make a reasonable attempt to avoid depositing snow at driveways and other entrances and around intersections;
- (d) snow banks will be kept to the outside edge of gravel Shoulder surfaces as set out in CHAPTER IV -1.C to ensure that any water created by thawing conditions can readily drain from Highway surfaces. The Province is responsible for snow removal on the travelled lanes of Highway 14, but snow deposited on the sidewalk/pedestrian pathway on Highway 14 shall be removed under this Contract, treating Highway 14 as a “Major” road for performance standards; and
- (e) all efforts will be made to minimize damage to Highways, District property or private property; such as, but not limited to Signs, Reflective Pavement Markers, fences, Median and Roadside barrier, curbs, Bridge Abutments and railing, lamp standards, etc. The Contractor, at his sole expense, will be responsible for repairing any damage to Highways, District or private property caused as a result of ploughing operations.

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1.C **Scheduling**

1.C.1 **Response Time**

- (a) Highway surface ploughing
 - [i] all Highways will have the Travelled Lanes surface ploughed within 48 hours of the last measurable snowfall; and
 - [ii] subject to CHAPTER IV -1.C.1(a)[i] the following table of maximum allowable total accumulations on each Highway Travelled Lane and maximum snow depths at which point ploughing will have started, will determine response timing by the Contractor during snow fall:

<i>HIGHWAY CLASSIFICATION</i>	Max Snow Depth when Ploughing is to Be Started on Highway	Maximum Allowable Accumulation	
		One Lane Each Direction	All Other Lanes
• Major	2.0 cm	6.0 cm	10.0 cm
• Collector and Goodridge Road	4.0 cm	8.0 cm	10.0 cm
• Local A	6.0 cm	10.0 cm	n/a
• Local B & C	10.0 cm	15.0 cm	n/a

Table 19

NOTES:

- to apply this Standard, ploughing routes and priorities will be established and submitted to the District of Sooke. The appropriate amount of equipment will be provided so that by starting to plow after a depth as shown in the second column, all the Highways in that Class will be ploughed before the maximum accumulation depth is reached,
- levels of service exceeding this Standard may also be required where, due to terrain and climatic variations, snow accumulations will vary at any one time along a Highway, and
- any other work the contractor may undertake independently, such as driveway ploughing, will not compromise achievement of this Standard or the Maintenance Standard for Winter Abrasives and De-Icing Application in any way;

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- (b) compacted snow or ice on pavement surfaces

The following table represents maximum periods of time from the end of storm snowfall within which the removal of compacted snow or ice from paved Highway surfaces will be performed by the Contractor, if requested by the District of Sooke:

<i>HIGHWAY CLASSIFICATION</i>			
Major	Collector and Goodridge Road	Local A	Local B & C
48 hours	48 hours	5 days	5 days

Table 20

NOTE:

- the use of De-Icing Chemicals may be required if the temperatures are at or above the minimum effective temperature of the De-Icing Chemical being used and rising (see the Maintenance Standard for Winter Abrasive and De-Icing Application);

- (c) Shoulder Clearing

The following table represents maximum periods of time from the end of storm snowfall within which snow clearing operations by the Contractor will have pushed snow and ice back beyond the Shoulders edge:

<i>HIGHWAY CLASSIFICATION</i>			
Major	Collector and Goodridge Road	Local A	Local B & C
3 days	3 days	5 days	5 days

Table 21

NOTE:

- notwithstanding the above, on Major and Collector Roads at all Superelevated curves or locations where the Shoulder edge is higher than the Traveled Lanes, snow and ice will be pushed fully beyond the Shoulder edge within 48 hours of the end of snowfall to prevent snowmelt drainage onto the pavement.

1.C.2 Schedule

Highway snow removal will be performed by the Contractor as required in accordance with the applicable Response Time set out in CHAPTER IV -1.C.1.

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2 WINTER ABRASIVE AND DE-ICING CHEMICAL APPLICATION

2.A Maintenance Service

Winter Abrasive and De-Icing chemical application will be performed by the contractor as required on Highways to maintain the Highways in a safe condition for the travelling public by eliminating hazardous, slippery surface conditions in accordance with this Maintenance

2.B Standard Specifications

2.B.1 Materials

Materials to be supplied by the District of Sooke and used by the Contractor are:

(a) Winter Abrasive

The maximum allowable particle size for Winter Abrasive materials, and the mean Gradation limits for these materials when tested according to ASTM Designation C117, is as follows:

	<i>HIGHWAY CLASSIFICATION</i>	
	Major	All Other Roads
[i] maximum particle size	9.5 mm	12.5 mm
[ii] metric screen size		
12.50 mm	--	100
9.50 mm	100	--
4.75 mm	50-95	50-95
2.36 mm	30-80	30-80
.600 mm	10-50	10-50
.300 mm	0-25	0-25
.075 mm	0-6	0-6

Table 22

NOTE:

- the figures shown under item [ii] represent the percent of material which passes that particular screen size;

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(b) Salt

Salt will conform to *CGSB Specification 15-GP-9M "Sodium Chloride Pavement De-icer"* and be within the following gradation limits for particle size:

Screen	Percentage Passing
12.00 mm	100
9.00 mm	90-100
4.75 mm	35-85
2.40 mm	15-55
1.20 mm	5-30
0.60 mm	0-10

Table 23

NOTE:

- CGSB Specifications may be obtained from: *Canadian Government Specifications Board Ottawa, Ontario, K1A 0S5.*

2.B.2 Performance Standard

(a) General:

- [i] all travelled lanes will be kept free of slippery or hazardous conditions in accordance with the Response Time set out in CHAPTER IV -2.C.1(b)
- [ii] De-Icing Chemicals are to prevent the development of slippery surfaces while Winter Abrasives are to provide improved traction on an already slippery surface. Winter Abrasives will be applied regardless of temperatures if surface conditions are slippery and hazardous,
- [iii] to apply this Standard, routes and priorities will be established and submitted to the District of Sooke; then prepare a timetable in consultation with the District of Sooke, local school districts and transit authority to ensure optimum bus service, and
- [iv] removal of compact snow and ice, if requested by the District of Sooke, will be removed from paved Highway surfaces, as set out in section CHAPTER IV -2.C.1(a)[ii], and the Contractor will be entitled to a payment in accordance with the terms of Part II of the Fee Schedule, or the District may elect to cause another Contractor to undertake the work.

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- (b) Winter Abrasive (slippery, icy sections...all Highways) will be applied at the following rates:

Description	Application Rate
[i] re-applications on slippery or icy surfaces	500 kilograms per two-lane kilometre (light)
[ii] initial continuous application or for compact snow, ice or freezing rain.	700 kilograms per two-lane kilometre (medium)
[iii] initial application on hills over 5% and on curves	1000 kilograms per two-lane kilometre (heavy)
[iv] the spreading of Winter Abrasives will not stop in the middle of a curve, halfway up a hill or at the location of any other Highway hazard, and	
[v] Winter Abrasives will always be used, instead of De-Icing Chemicals if pavement is dry and snow is Drifting or blowing off.	

Table 24

- (c) De-Icing Chemical

A heavy application of Salt as specified below is required to melt packed snow and ice after a snowfall but a much lighter application can be used to prevent ice and snow accumulations from sticking initially by allowing a brine of Salt and water to form on the pavement surface. Therefore, Salt will be applied before a snowfall, if the temperature is minus 6° Celsius and above, as a preventative measure instead of as an after-the-fact treatment. Heed should be paid to weather forecasts so that applications are well timed. The following minimum application rates will be used:

	Description	Application Rate
[i]	light application	surface temperature near freezing with light snow or sleet or to prevent Black Ice
[ii]	average application	early in day with surface temp -4° Celsius & rising; conditions with snow, sleet or freezing rain
[iii]	heavy application	early in day with surface temp. -4° Celsius & stable or -6° Celsius & temp. rising or late in day with temp.-4° Celsius & rising; accumulation of packed snow or ice on travelled surfaces
[iv]	the effect of any De-Icing Chemical is dependent on pavement temperature. If the temperature, when using Salt, is not minus 6° Celsius or above then a Winter Abrasive material will be used to prevent slippery surface conditions, and	
[v]	de-icing will not be performed under the following circumstances: <ul style="list-style-type: none"> • if pavement temperature is below minus 4° Celsius, if air temperature is below minus 6° Celsius or if temperatures are falling, and/or • if pavement is dry and snow is Drifting or blowing off. 	

Table 25

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2.B.3 Methods

Automated equipment with electronic spreader and hydraulic controls will be used to spread materials at controlled application rates.

(a) Winter Abrasive application

- [i] Winter Abrasives will be spread in a band of three or four metres in width, keeping the vehicle in a position to apply Winter Abrasive to both lanes of a two-lane Highway,
- [ii] spinners should be shut off when meeting approaching traffic to avoid causing a hazard on the Highway, except on curves or hills as described in CHAPTER IV -2.B.2(b) [iii] and CHAPTER IV -2.C.1(b). [i], and
- [iii] speeds while spreading Winter Abrasives will be kept low enough that Winter Abrasives will not be distributed beyond the Travelled Lanes.

(b) De-Icing Chemical application

- [i] Salt will be spread in a two metre wide strip if removing compact snow and ice, so the melting brine can spread laterally across the pavement,
- [ii] Salt will be spread in a strip at least 2 metres wide if applying before snow fall or for Black Ice removal, and
- [iii] Salt will be spread on the high side of Super-elevated curves so that the melting brine can spread across the full pavement.

NOTE:

- chemical applications early in the day can take advantage of the normal warming daytime trend. In addition, the action of the sun and traffic help Salt work by increasing the temperature and by mixing actions.

2.B.4 Miscellaneous

- (a) additional winter patrols for inspection of Highway surface conditions will be required to ensure Travelled Lanes are not slippery. Slippery conditions or icing may occur at shaded Highway sections, Overpasses and Bridge decks, particularly at night. Patrol vehicles will be prepared to deal with conditions when detected, by carrying Winter Abrasive or De-Icing Chemical;
- (b) pre-snowfall or early snowfall application will greatly reduce snow and ice removal operations later due to the brine layer on the pavement. This will also ensure that no Black Ice forms on pavement surfaces;
- (c) curves, school zones, intersections and Bridge deck locations will be given priority response;

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- (d) sufficient stockpiles of Winter Abrasive and De-Icing Chemical materials will be available at all times prior to and throughout the winter season, to meet ongoing requirements; and
- (e) pavement surface and air temperature sensing thermometers will be used to determine the difference in temperature between the air and the paved surface when deciding whether to use De-Icing Chemicals or Winter Abrasives.

2.C Scheduling

2.C.1 Response Time

- (a) De-Icing Chemical application

[i] to prevent Black Ice and for pre-snowfall application

When temperatures are near-zero and falling and pavements are wet or when storm snowfalls are forecast or are just starting, the following are maximum response times for De-Icing Chemical application by the Contractor on paved Highway surfaces:

<i>HIGHWAY CLASSIFICATION</i>			
Major	Collector and Goodridge Road	Local A	Local B & C
2 hours	3 hours	5 hours (if still preventable)	n/a

Table 26

[ii] to remove compact snow and ice on paved surfaces:

When requested by the District of Sooke the Contractor will, after snowfalls have ended and ploughing operations on each Highway have been completed, treat paved Highway surfaces with De-Icing Chemicals within the following maximum response times to remove any compacted snow or ice remaining.

	<i>HIGHWAY CLASSIFICATION</i>			
	Major	Collector and Goodridge Road	Local A	Local B & C
[i] initial application	24 hours	48 hours	5 days	n/a
[ii] completely bare	48 hours	72 hours	10 days	n/a

Table 27

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NOTES:

- the above response times are for temperature conditions at or above minus 6° Celsius and rising when using Salt. Otherwise traction Winter Abrasives will continue to be applied in accordance with CHAPTER IV -2.C.1(b), notwithstanding the foregoing if hazardous Black Ice or slippery conditions are encountered during patrols immediate application of Winter Abrasives or De-Icing Chemicals will be undertaken,

(b) Winter Abrasive application to provide traction on icy or slippery surfaces

During and after snowfalls, any icy or slippery Highway surface conditions will be treated by the Contractor within the following maximum response times from initial detection by or notification to the Contractor.

	<i>HIGHWAY CLASSIFICATION</i>			
	Major	Collector	Local A	Local B & C
[i] during snowfall				
• hills over 5% gradient (one lane each direction)	2 hours	2 hours	3 hours	6 hours
• curves under 40 kilometres per hour	2 hours	2 hours	3 hours	6 hours
• school zones & intersections	2 hours	2 hours	3 hours	6 hours
• other locations	3 hours	3 hours	6 hours	8 hours
[ii] freezing rain (all locations)	1 hour	2 hours	4 hours	5 hours
[iii] Black Ice (all locations)	1 hour	2 hours	4 hours	5 hours
[iv] after snowfall - hills (all lanes)	8 hours	8 hours	24 hours	48 hours
• all curves	8 hours	8 hours	24 hours	48 hours
• all other locations	24 hours	24 hours	36 hours	n/a

Table 28

NOTES:

- Notwithstanding the foregoing, if Black Ice or slippery conditions are encountered during patrols immediate application of Winter Abrasives or De-Icing Chemicals is expected and,
- This Maintenance standard is to be performed by the Contractor in conjunction with the Maintenance Standard for Highway Snow Removal

2.C.2 Schedule

Winter Abrasive and De-Icing Chemical application will be performed as required by the contractor in accordance with the applicable Response Time set out in CHAPTER IV -2.C.1

3 ROADSIDE SNOW AND ICE CONTROL

3.A Maintenance Service

Roadside snow and ice control will be performed by the Contractor as required on Highways to:

- (a) remove snow and ice from sidewalks on Bridges; and
- (b) clear snow accumulations from intersections, Medians and around signs;

in accordance with the following priorities and time constraints.

3.B Specifications

3.B.1 Materials

Winter Abrasive materials and De-Icing Chemicals will be provided by the District of Sooke and used by the Contractor to provide traction against slippery conditions and to remove ice. See the Maintenance Standard for Winter Abrasives and De-Icing Application.

3.B.2 Performance Standard

- (a) removal of all loose snow, slush and ice on Bridge sidewalks and walkways leading to these structures after Highway ploughing operations, and
- (b) where snow has been piled high enough to restrict Sight Distance at intersections, around Highway signs, the snow will be cleared following snow ploughing operations on the Highway.

3.B.3 Miscellaneous

- (a) Salt will be used in removing ice build-up when temperatures are at or above minus 6° Celsius and rising; and
- (b) traffic control will be performed by the Contractor as required in accordance with the Maintenance Standard for Highway Traffic Control.

3.C Scheduling

3.C.1 Response Time

- (a) The following are maximum response times for the clearing of snow and ice on the facility noted, by the Contractor from the time first snowfall ceased or Highway snow ploughing operations have finished:

	<i>HIGHWAY CLASSIFICATION</i>			
	Major	Collector and Goodridge Road	Local A	Local B & C
[i] Bridge Sidewalks	24 hours	48 hours	72 hours	n/a
[ii] Sidewalk Approaches to Structures	72 hours	5 days	5 days	n/a
[iii] Sight Distance obstructions	3 days	3 days	3 days	5 days

Table 29

- (b) ice and snow, overhanging the Highway will be removed within 8 hours from the time first detected by or reported to the contractor.

3.C.2 Schedule

Roadside snow and ice control will be performed as required by the Contractor in accordance with the applicable Response Time set out in CHAPTER IV -3.C.1