

## **B.C. MINISTRY OF TRANSPORTATION**

### **Maintenance Specification Chapter 3-300**

#### **HIGHWAY SNOW REMOVAL**

##### **1. OBJECTIVE**

To remove loose snow, slush and compact snow; to protect Highway Users from situations that are unsafe; to ensure the safe and efficient movement of traffic and to ensure that the Contractor utilizes and deploys, those resources that are required to comply with this Specification, in a manner which anticipates and responds in advance of a snowfall.

##### **2. GENERAL PERFORMANCE SPECIFICATIONS**

###### **2.1 Routine Maintenance Services**

All services for this Maintenance Specification are Routine.

###### **2.2 Quantified Maintenance Services**

Not applicable to this Maintenance Specification.

##### **3. DETAILED PERFORMANCE SPECIFICATIONS**

###### **3.1 Routine Maintenance Services**

The Contractor must:

- a) remove snow on the full width of the Travelled Lanes to ensure that accumulations remain below the Maximum Allowable Accumulations shown on the table in Section 3.1.1.a)i);
- b) when snowfall is forecast, proactively:
  - i) increase snow and weather observations, monitoring and review current weather station information;
  - ii) increase weather forecast monitoring;
  - iii) extrapolate from observations and broader weather forecasts to anticipate local road conditions;

- iv) increase patrols as outlined in the Maintenance Specification for *Highway Patrol*;
  - v) notify and deploy resources in advance, which are sufficient to respond to anticipated snowfall. Resources must be deployed to key geographic areas (e.g.: mountain passes, higher elevations, known frequent snowfall and/or blowing snow areas) prior to the occurrence of the anticipated snowfall to ensure that snow and slush removal will commence early in severely impacted areas;
  - vi) communicate internally and externally of actions to be taken; and
- c) in response to unforeseen snowfall:
- i) notify/deploy resources; and
  - ii) remove snow and slush in accordance with the time frames outlined in section 3.1.1;
- d) ensure optimum proactive service to local stakeholders including but not limited to, local industries (forestry, mining, oil and gas), the RCMP, local and regional governments, key commuters and school buses. The routes used by these stakeholders are to receive priority service, in the allocation of resources to their road classifications, and specific to their individual needs;
- e) during extended periods of extreme cold, remedy unsafe conditions such as, but not limited to, ice on the Travelled Lanes and those conditions arising from melt and refreeze situations;
- f) keep Shoulders clear more frequently in areas of high pedestrian use, in consultation with local stakeholders;
- g) plow Overpass and interchanges without throwing snow onto underlying Highways or railways; and
- h) keep free of snow, ice and slush, Rest Areas, pull-outs, parking areas, Weigh Scale Areas, and other areas designated by the Province with the same priority as a Highway of the next lower class from the adjacent Highway (e.g.; adjacent highway is class “B” then maintenance of the Rest Area is Class “C”) and designated chain-up areas with the same priority as the adjacent Highway.

### 3.1.1 Performance Time Frames

#### a) Maximum Allowable Accumulations

- i) The Contractor must start removing snow on the full width of the Travelled Lanes, ensuring that accumulations remain below the Maximum Allowable Accumulations shown in the table below:

Winter Highway Classification	Maximum Allowable Accumulation		
	One Lane Each Direction	Second Lanes	All Other Lanes
A	4.0 cm	8.0 cm	12.0 cm
B	6.0 cm	10.0 cm	16.0 cm
C	10.0 cm	n/a	20.0 cm
D	15.0 cm	n/a	n/a
E	25.0 cm	n/a	n/a

- ii) Notwithstanding the foregoing Maximum Allowable Accumulation, plowing of slush and removal of broken compact snow from the Travelled Lanes that is unsafe must be completed within the following timeframes:

Winter Highway Classification			
A	B	C	D
90 min	2 hours	6 hours	n/a

#### **Legend**

min – minutes

h - hours

**b) Completion of Snow Removal**

The Contractor must complete removal of loose snow and slush from Highway surfaces on all Travelled Lanes on Winter Class A, B, and C Highways within 2 days of the end of the last measurable snowfall. Class D Highways shall be plowed within 2 days once the accumulation exceeds 5 cm. In allocating resources, appropriate attention must be given to areas known to be impacted first by snowfall and slush weather events (e.g.: mountain passes, higher elevation, known frequent snowfall and blowing snow areas).

- c) The following table establishes the time from end of the last measurable snowfall and snow removal operations on the Travelled Lanes have been completed, within which the Contractor must remove compacted snow or ice from all Travelled Lanes with paved Highway surfaces:

<b>Winter Highway Classification</b>			
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
2 d	3 d	7 d	21 d

**Legend**

d – days

- d) If extended periods of extreme cold make it impossible for the Contractor to comply with 3.1.1 c), the Contractor must remedy unsafe conditions including but not limited to, roughness and slippery surfaces.
- e) The following table establishes the time from the end of the last measurable snowfall within which the Contractor must push snow and ice beyond the Shoulder edge:

<b>Winter Highway Classification</b>			
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
4 d	6 d	10 d	24 d

**Legend**

d – days

- f) Notwithstanding the above, on Class A and B Highways, at all Superelevated curves and other locations where the Shoulder edge is higher than the Travelled Lanes, the Contractor must push snow and ice beyond the Shoulder edge within two days of the end of the last measurable snowfall to prevent snowmelt drainage onto the Travelled lanes. When Guardrail prevents the complete removal of the snow to the Shoulder edge, the Contractor must deal with any resulting condition that is unsafe or has the potential to be unsafe.

**3.2 Quantified Maintenance Services**

Not applicable to this Maintenance Specification.

**3.2.1 Performance Time Frames**

Not applicable to this Maintenance Specification.

**3.3 Materials**

Not applicable to this Maintenance Specification.

**4. WARRANTY**

Not applicable to this Maintenance Specification.

# BC MINISTRY OF TRANSPORTATION

## Maintenance Specification 3-310

### WINTER ABRASIVE AND CHEMICAL SNOW AND ICE CONTROL

#### 1. OBJECTIVE

To facilitate the safe and efficient movement of traffic on Highways in winter conditions through the use of Winter Abrasives and chemical snow and ice control applications, and to ensure that the Contractor utilizes and deploys, those resources that are required to comply with this Specification, in a manner which anticipates and responds in advance of a Weather Event as defined in the Maintenance Specification.

#### 2. GENERAL PERFORMANCE SPECIFICATIONS

##### 2.1. Routine Maintenance Services

All services for this Maintenance Specification are Routine.

##### 2.2. Quantified Maintenance Services

Not applicable to this Maintenance Specification.

#### 3. DETAILED PERFORMANCE SPECIFICATIONS

##### 3.1. Routine Maintenance Services

The Contractor must:

- a) provide proactive winter maintenance services, in advance of and during a forecasted weather event, by:
  - i) applying Winter Abrasives and/or chemicals to minimize the development of Slippery surface conditions on Highways and to facilitate the removal of snow, compact snow and ice, as appropriate for the location. For the purposes of this Specification, a Weather Event includes any meteorological condition that permits the development of hazardous Slippery surface conditions which requires the application of Winter Abrasives, anti-icing or De-icing Chemicals and/or snow removal procedures to maintain or re-establish safe winter driving conditions;
  - ii) increasing monitoring of road temperatures and condition forecasts through Road Weather Information Systems

(RWIS), other available forecast and information systems and patrols as necessary, to support the appropriate pre-Weather Event deployment of resources;

- iii) notifying and deploying resources in advance of a Weather Event as required. Resources should be deployed and located to key geographic areas (e.g.: mountain passes, higher elevation, known frequent snowfall and/or blowing snow, Black Ice areas) prior to the occurrence of the forecasted Weather Event in order that Winter Abrasives and chemical snow and ice control can commence prior to, and during the anticipated weather and surface conditions;
- b) when a non-forecast event occurs and when hazardous Slippery conditions are detected by or reported to the Contractor, immediately deploy resources to restore surface traction by applying Winter Abrasive and/or chemicals when hazardous Slippery conditions are detected by or reported to the Contractor;
- c) acquire and utilize Road Temperature and Condition (RTC) forecasts to determine if a Weather Event could develop that would reduce surface traction on the Highway surface; and, in advance of a forecasted event, respond by pre-treating the Highway surface with Winter Abrasives or anti-icing chemicals, as appropriate for the location;
- d) utilize RWIS data to monitor existing and developing conditions in order to better time the application of Winter Abrasives or chemicals, as appropriate for the location, in advance of a Weather Event;
- e) utilize RWIS data, if available, to determine if previous chemical application residuals are sufficient to maintain pre-weather event surface traction when a Weather Event is forecast, and to determine if applications of additional anti-icing or De-icing Chemicals are required to maintain surface traction; and
- f) utilize other methodologies that may be available, such as thermal mapping, in conjunction with RTC forecasts and other road and weather forecast services, to better identify the locations and areas that may develop hazardous surface conditions as a result of a Weather Event.

### 3.1.1. Performance Time Frames

The Contractor must:

- a) deploy resources to appropriate key locations (e.g.: mountain passes, higher elevation, known frequent snowfall and/or blowing snow, Black Ice areas) and at locations indicated by the road and weather condition forecast, at least 60 minutes in advance of a forecasted Weather Event or forecasted hazardous road conditions such as snowfall, Black Ice and freezing rain;
- b) restore traction within the response times, from the time the deficiency was detected by or reported to the Contractor, as specified in the following table:

Condition	Location	Winter Highway Classification			
		A	B	C	D
(i) from beginning and or during snowfall event	hills over 5% gradient (one lane each direction)	60 min	90 min	2 h	4 h
	curves under 60 kilometres per hour	60 min	90 min	2 h	4 h
	school zones & intersections	90 min	2 h	3 h	6 h
	other locations	2 h	3 h	4 h	8 h
(ii) Freezing rain	all locations	2 h	3 h	5 h	6 h
(iii) Black Ice	all locations	2 h	3 h	5 h	6 h
(iv) after snowfall	all hills (all lanes)	5 h	8 h	24 h	48 h
	all curves	5 h	8 h	24 h	48 h
	all other locations	24 h	36 h	3 d	as required
(v) when Slippery surfaces are encountered during patrol	all locations	immediate application	immediate application	immediate application	immediate application

**Legend**

min - minutes

h – hours

d – days

- c) prioritize locations within the Highway Classifications, such as mountain passes, higher elevation areas, areas known for the formation of Black Ice, accident sites, Bridge Decks and locations known to be unsafe;



- d) remove compact snow or ice remaining on paved Highway surfaces, after snowfalls have ended, and snow removal operations on the Travelled Lanes have been completed, within the times specified in the table below:

<b>Winter Highway Classification</b>			
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
2 d	3 d	7 d	21 d

**Legend**

d – days

- e) in extended periods of extreme cold, remedy unsafe conditions immediately.

**3.2. Quantified Maintenance Services**

Not applicable to this Maintenance Specification.

**3.2.1. Performance Time Frames**

Not applicable to this Maintenance Specification.

**3.3 Materials**

The Contractor must:

- a) use materials and chemicals used in snow and ice control from the Recognized Products Lists or as accepted in writing by the Province for use on Highways;
- b) use materials in accordance with the maximum allowable particle size for Winter Abrasives and the mean Gradation limits when tested according to ASTM Designations C136 and C117, and as shown on the following table:

	<b>Winter Highway Classification</b>		
	<b>Class A &amp; B</b>	<b>all Class C and Class D paved only</b>	<b>all Class D gravel Highways</b>
(i) maximum particle size	12.5 mm	16 mm	19 mm
(ii) metric screen size			
19 mm	N/A	N/A	100
16 mm	N/A	100	N/A
12.5 mm	100	N/A	N/A
9.5 mm	N/A	80-100	80-100
4.75 mm	50-95	50-95	50-95
2.36 mm	30-80	30-80	30-80
0-0.600 mm	10-50	10-50	10-50
0-0.300 mm	0-25	0-25	0-25
0-0.075 mm	0-6	0-6	0-6

**Note:** The figures shown in the above table represent the percent of material which passes through that particular screen size.

#### 4. **WARRANTY**

Not applicable to this Maintenance Specification.

## **B.C. MINISTRY OF TRANSPORTATION**

### **Maintenance Specification Chapter 3-320**

#### **ROADSIDE SNOW AND ICE CONTROL**

##### **1. OBJECTIVE**

To maintain the Roadside free of accumulated snow and ice that is unsafe for Highway Users and/or properties; or threatens the functional integrity of the Highway.

##### **2. GENERAL PERFORMANCE SPECIFICATIONS**

###### **2.1 Routine Maintenance Services**

All services for this Maintenance Specification are Routine.

###### **2.2 Quantified Maintenance Services**

Not applicable to this Maintenance Specification.

##### **3. DETAILED PERFORMANCE SPECIFICATIONS**

###### **3.1 Routine Maintenance Services**

The Contractor must:

- a) protect the Highway from drifting snow and falling Debris, snow and ice;
- b) remove Sight Distance obstructions;
- c) remove all loose snow and ice from sidewalks, stairways and walkways on Highways, Pedestrian Overpasses and pedestrian tunnels;
- d) clear snow accumulations from intersections, Medians and around Roadside and Median barriers and Sign Systems;
- e) remove snow and ice from rock faces, tunnel walls, Bridges, and all other overhead features;
- f) remove snow and ice from cattleguard structures;

- g) remove snow and ice encroaching, overhanging or otherwise accumulating above the Travelled Lanes and Shoulder tops;
- h) remove snow and ice from information kiosks and other tourist information facilities, as directed by the Province;
- i) provide storage requirements for continuing winter maintenance operations;
- j) remove snow and ice to facilitate drainage;
- k) restore flow in frozen drainage structures;
- l) restore overhead clearances to utility lines reduced by Highway snow removal operations;
- m) erect snow fences in Drifting problem areas as necessary;
- n) construct Snow Berms as required in conjunction with snow fences to prevent Drifting. Where snowfall accumulations exceed one metre in depth, the Contractor must plow snow from behind the snow fences to form trenches to catch blowing snow;
- o) be responsible to obtain permission for snow fence or Snow Berm erection from private landowners when necessary;
- p) ensure traction has been restored by Winter Abrasive application on sidewalks and walkways having grades over 5 percent;
- q) clear a minimum of 75% of the sidewalk width on Bridge structures of snow and ice; and in areas constricted by the structure to one metre or less in width, clear the sidewalk to full width;
- r) remove all snow from overhead structures, such as Bridges and pedestrian overpasses in a manner that will not endanger vehicles, pedestrians, property, railways or other facilities below and where snow removal is restricted, remove snow from the structure and dispose of in an appropriate location;
- s) remove snow accumulations and ice deposits in excess of 30 cm in depth from the top of Roadside or Median barriers or Bridge railings; and
- t) protect Highway Users from snow accumulations and ice deposits such as on overhead Signs, Bridges, and rock faces that have historically affected the Travelled Lanes, or in identified locations.

### 3.1.1 Performance Time Frames

The Contractor must:

- a) complete the clearing of snow and ice on Highways, and restore traction on pedestrian facilities, commencing from the time snow removal on adjacent Highways is completed, within the times shown on the table below:

	Highway Classification				
	A	B	C	D	E
(i) Bridge sidewalks	24 h	24 h	24 h	3 d	n/a
(ii) Pedestrian Overpasses or Underpasses	24 h	24 h	24 h	n/a	n/a
(iii) sidewalks, walkways, and sidewalk approaches to structures, information kiosks and other tourist information facilities	36 h	36 h	36 h	3 d	n/a
(iv) intersections, Medians, Railway Crossings and Railway Crossing Approaches	2 d	3 d	8 d	12 d	20 d
(v) Roadside and Median barriers	2 d	3 d	8 d	12 d	20 d
(vi) Sight Distance obstructions	3 d	5 d	8 d	12 d	20 d

**Legend**

h - hours

d – days

- b) start removing snow from ditches and/or restoring flow in drainage structures, commencing from the time the deficiency was detected by or reported to the Contractor, within the times shown in the table below:

<b>Highway Classification</b>			
<b>A &amp; B</b>	<b>C</b>	<b>D</b>	<b>E</b>
4 h	12 h	24 h	3 d

**Legend**

h - hours

d – days

- c) complete construction or maintenance of Snow Berms and snow fences as follows:
  - i) prior to the first annual snowfall for snow fences;
  - ii) once sufficient snow has fallen for Snow Berms; and
  - iii) prior to snowfall depths exceeding 1 metre for the construction of trenches behind snow fences;
- d) remove all snow and ice accumulating on rock faces, tunnel walls, Bridges and all other overhead features within 8 hours from the time the deficiency was detected by or reported to the Contractor;
- e) remove snow and ice from cattleguards within 8 hours from the time the deficiency was detected by or reported to the Contractor;
- f) where a Sight Distance obstruction occurs at an intersection of Highways of different Classifications, use the Performance Time Frame as established in this Maintenance Specification for the Highway that is designated at the higher Classification; and
- g) restore vertical clearances to overhead utilities reduced by snow plowing operations within 3 days after completion of the snow plowing operation.

### **3.2 Quantified Maintenance Services**

Not applicable to this Maintenance Specification.

#### **3.2.1 Performance Time Frames**

Not applicable to this Maintenance Specification.

### **3.3 Materials**

Winter Abrasives must be in accordance with the Maintenance Specification for *Winter Abrasives and Chemical Snow and Ice Control*.

## **4. WARRANTY**

Not applicable to this Maintenance Specification.

## **B.C. MINISTRY OF TRANSPORTATION**

### **Maintenance Specification Chapter 3-340**

#### **HIGHWAY CONDITION REPORTING**

##### **1. OBJECTIVE**

To communicate Highway conditions to Highway Users, regulatory agencies, police authorities and the Province.

##### **2. GENERAL PERFORMANCE SPECIFICATIONS**

###### **2.1 Routine Maintenance Services**

All services for this Maintenance Specification are Routine.

###### **2.2 Quantified Maintenance Services**

Not applicable to this Maintenance Specification.

##### **3. DETAILED PERFORMANCE SPECIFICATIONS**

###### **3.1 Routine Maintenance Services**

The Contractor must:

- a) observe and record weather and road conditions; and prepare and submit Highway condition reports electronically, using internet technology, and in a format prescribed by the Province, with the following information:
  - i) Highway surface conditions;
  - ii) weather;
  - iii) visibility
  - iv) maintenance activities
  - v) load restrictions;
  - vi) travel advice; and
  - vii) full or partial Highway delays and closures and the reason for the delays and closures;
- b) report to the Province, through the District Manager of Transportation, all motor vehicle accident fatalities and other significant incidents on Highways;



- c) prepare and release traffic advisories approved by the Province, where Highway closures, lane closures and/or weather conditions are unsafe or have the potential to become unsafe for Highway Users;
- d) communicate with appropriate regulatory agencies and police authorities when conditions on the Highway require the involvement of those agencies and/or police;
- e) publish names and telephone numbers of key Contractor personnel for local Highway Users, police and other agencies; and
- f) provide a toll-free telephone service attended by an individual 24 hours per day, 7 days a week to respond to reports of and requests for local and adjoining service area road conditions; and potential or existing Highway hazards; to receive and record complaints or other comments or concerns from Highway Users, regulatory agencies, police authorities and the Province.

Note: The Contractor will not refer Highway Users to the Province's 1-900 number for service area specific and adjoining service area information.

### **3.1.1 Performance Time Frames**

The Contractor must:

- a) prepare and deliver an updated Highway condition report to the Province at 5:00 a.m., 9:00 a.m. and 1:00 p.m. daily from October 1 to April 30;
- b) prepare and deliver the updated Highway condition report to the Province at 7:00 a.m. and 3:00 p.m. daily from May 1 to September 30;
- c) report immediately to the Province any adverse or extreme road surface conditions and changes in weather conditions affecting visibility and/or driving conditions or as specified by the Province; and
- d) prepare and release immediately, upon approval by the Province, travel advisories as necessary to inform Highway Users of conditions identified in 3.1.c) above;

- e) communicate to the Province, no later than 3:00 p.m. on the day preceding the commencement of the maintenance activity, any plans for maintenance activities which require partial closures, lane closures or cause traffic delays; and
- f) report to the Province, recommendations for changes to the Province's driver information display Signs, as defined in the Province's driver information display Sign policy, as may be amended or replaced by the Province from time to time.

### **3.2 Quantified Maintenance Services**

Not applicable to this Maintenance Specification.

#### **3.2.1 Performance Time Frames**

Not applicable to this Maintenance Specification.

### **3.3 Materials**

Not applicable to this Maintenance Specification.

## **4. WARRANTY**

Not applicable to this Maintenance Specification.