



MINISTRY OF TRANSPORTATION

SCHEDULE "21"

Maintenance Specifications

2003-2004

HIGHWAY MAINTENANCE CONTRACTS

MAINTENANCE SPECIFICATIONS

FEBRUARY 2003

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TABLE OF CONTENTS

CHAPTER	PAGE
Intro	Introduction I-5
	A. Maintenance Services I-6
	B. Materials I-7
	C. Interpretation..... I-8
	D. Warranties..... I-8
	E. Maintenance Services Completion..... I-8
	F. Road Inventory Management System (RIMS) I-9
	G. Additional Maintenance Services..... I-9
	H. Emergency Maintenance Services..... I-10
	I. Damage to Government Property..... I-11
	J. Referenced Manuals..... I-12
1	Surface Maintenance
	Highway Pavement Patching and Crack Sealing..... 1-100
	Highway Surface Treatment 1-110
	Gravel Surface Grading and Re-shaping 1-130
	Dust Control and Base Stabilization..... 1-140
	Highway Surface and Shoulder Gravelling 1-150
	Highway Shoulder Maintenance..... 1-160
	Road Base Maintenance 1-170
	Pavement Surface Cleaning..... 1-180
	Debris Removal 1-190
	Highway Structures Maintenance..... 1-200
	Curb, Island and Barrier Maintenance..... 1-220
	Railway Crossing Maintenance 1-230
2	Drainage Maintenance
	Ditch and Watercourse Maintenance..... 2-250
	Drainage Appliance Maintenance..... 2-260
	Shore, Bank and Watercourse Maintenance..... 2-270
	Engineered Wetland and Water Quality Pond Maintenance..... 2-280

3	Winter Maintenance	
	Highway Snow Removal	3-300
	Winter Abrasive and Chemical Snow and Ice Control.....	3-310
	Roadside Snow and Ice Control	3-320
	Highway Condition Reporting.....	3-340
4	Roadside Maintenance	
	Roadside Vegetation Control.....	4-350
	Litter Collection and Graffiti Removal	4-370
	Rest Area and Roadside Facility Maintenance	4-380
	Roadside Fence Maintenance	4-400
5	Traffic Maintenance	
	Sign System Maintenance.....	5-440
	Temporary Line Marking and Eradication	5-450
	Highway Traffic Control	5-470
6	Structure Maintenance	
	Bridge Deck Maintenance	6-500
	Bridge and Structure Cleaning.....	6-510
	Bridge Drain and Flume Maintenance.....	6-520
	Bridge Joint Maintenance.....	6-530
	Bridge Bearing Maintenance	6-540
	Bailey and Acrow Bridge Maintenance.....	6-560
	Minor Painting of Bridge Structures	6-570
	Concrete Structure Maintenance	6-600
	Steel and Aluminum Structure Maintenance.....	6-605
	Timber Truss Bridge Maintenance	6-620
	Bridge Piling Maintenance	6-640
	Timber and Log Structure Maintenance	6-650
	Retaining Structure Maintenance	6-660
	Multiplate Structure Maintenance	6-680
	Bridge Railing Maintenance.....	6-690
	Debris Torrent Structure Maintenance	6-740

7	Emergency Maintenance	
	Flood Control and Washout Response	7-760
	Mud, Earth and Rock Slide Response	7-770
	Highway Incident and Vandalism Response	7-780
	Snow Avalanche Response.....	7-790
	Structural Damage Response.....	7-800
	Bailey and Acrow Emergency Installation	7-810
8	Inspection	
	Highway Inspection	8-830
	Highway Patrol	8-840
	Bridge Inspection.....	8-850
9	Definitions	9
10	Quantified Maintenance Services	10

INTRODUCTION

The Maintenance Specifications are described in this document under the following categories:

- Surface Maintenance
- Drainage Maintenance
- Winter Maintenance
- Roadside Maintenance
- Traffic Maintenance
- Structure Maintenance
- Emergency Maintenance
- Inspection

A. MAINTENANCE SERVICES

Maintenance Services are comprised of two general groups of maintenance activities as follows:

Routine Maintenance Services	<p>Consists generally of the maintenance and repair of the Highway and Bridge infrastructure:</p> <ol style="list-style-type: none">1. to a condition that is safe for the travelling public and other Highway Users;2. that is of an unpredictable and/ or non-quantifiable and/ or non-measurable nature as implied by the response times, frequencies and other conditions specified;3. of such a predictable and/ or cyclical nature that the quantity of work is determined by the frequency specified; and4. that is not specifically described as Quantified Maintenance Services.
Quantified Maintenance Services	<p>Consists generally of the maintenance and repair of the Highway and Bridge infrastructure:</p> <ol style="list-style-type: none">1. to a condition that is safe for the travelling public and other Highway Users;2. that is of a reasonably predictable or seasonal in nature;3. that is of a minor restorative nature affecting the life cycle of the Highway and Bridge infrastructure; or4. that is quantifiable and measurable; and5. that is to be planned within the Contract Year to the limit of the identified quantities.

Maintenance Services are set out in each Maintenance Specification in the following manner:

Section 1 Objective	The objective or intent of each Maintenance Specification.		
Section 2 General Performance Specifications	2.1	a brief description of the requirements for Routine Maintenance Services;	
	2.2	a brief description of the requirements for Quantified Maintenance Services.	
Section 3 Detailed Performance Specifications	3.1	a detailed description of the requirements for Routine Maintenance Services, including locations, time frames and materials;	
	3.2	a detailed description of the requirements for Quantified Maintenance Services, including locations, time frames and materials.	
Section 4 Warranty	The warranty provisions, when applicable.		

B. MATERIALS

Whenever Section B of the Introduction to these Maintenance Specifications is referenced, the Contractor will use materials:

- in accordance with the Standard Specifications for Highway Construction; or
- in accordance with the Approved Products List; or
- as approved in writing by the Province.

B.1 Whenever Section B1 of the Introduction to these Maintenance Specifications is referenced, the Contractor will use materials and procedures in accordance with:

- the Standard Specifications for Highway Construction; or
- the Approved Products List; or
- materials as approved in writing by the Province.

C. INTERPRETATION

Words in these Maintenance Specifications will bear the meaning assigned to them in Chapter 9 of these Maintenance Specifications and in Article I of the Maintenance Agreement. In the event of a conflict between the meaning of a word assigned by Chapter 9 of these Maintenance Specifications and the meaning assigned by Article I of the Maintenance Agreement, the former meaning will prevail.

Whenever more than one Maintenance Specification or more than one part of a Maintenance Specification applies to a particular Highway location, condition, circumstance or activity, the Contractor will comply with each and every applicable Maintenance Specification or part of a Maintenance Specification.

D. WARRANTIES

The warranties set out in these Maintenance Specifications will survive the expiration or termination of the Maintenance Agreement. Where a Contractor performs work as a result of a deficiency covered by a warranty in these Maintenance Specifications, the Contractor will not be credited for that work under Quantified Maintenance Services.

E. MAINTENANCE SERVICES COMPLETION

Wherever the time within which work must be performed by the Contractor under these Maintenance Specifications exceeds the time remaining in the Term, the Contractor will, notwithstanding any other provision of these Maintenance Specifications, perform the work prior to the end of the Term.

F. ROAD INVENTORY MANAGEMENT SYSTEM

- a) That part of the Province's Road Inventory and Maintenance System (RIMS) relating to the Service Area, including the Area Specific Information and the Bridge and Yard Information set out in Volume III and Volume IV of the Request for Proposals for the Service Area, is incorporated by reference and forms a part of these Maintenance Specifications.
- b) The Province may from time to time, and in its sole discretion, add to, delete from, or modify the information set out in the RIMS.
- c) If the Contractor identifies any discrepancies between the RIMS information for the Service Area and the road features actually present in the Service Area, the Contractor will notify the Province immediately of any such discrepancies.

G. ADDITIONAL MAINTENANCE SERVICES

Certain Maintenance Specifications, mostly related to structure maintenance in Chapter 6, include a description of any fiscal financial responsibility or other specified financial capping, in order to limit the Contractor's exposure or risk. Any work which the Province directs the Contractor to perform beyond the specified financial caps will be performed by the Contractor as Additional Maintenance Services.

If the Contractor estimates that the cost to repair the Highway exceeds the financial caps identified in the respective Maintenance Specifications, the following will apply:

- a) the Contractor must immediately notify the Province and must provide an estimate, in writing, of the costs to repair the Highway;
- b) the Contractor must continue to perform the services as set out in the applicable Maintenance Specification, or until notified by the Province to cease;
- c) the Province may elect to do any one or more of the following:
 - i) instruct the Contractor to complete the work, or part thereof, in which case the Contractor will be entitled to payment in accordance with the terms of Part 2 of the Fee Schedule for the actual cost to the Contractor of completing the work that:
 - 1. is in excess of the financial caps set out in the applicable Maintenance Specification; and
 - 2. is included in the estimate provided under a) above; or

- ii) instruct another Contractor to complete the work, or part thereof; or
- iii) complete the work, or part thereof.

H. EMERGENCY MAINTENANCE SERVICES

For the Maintenance Specifications for *Flood Control and Washout Response*, *Mud, Earth and Rock Slide Response* and *Structure Damage Response*, the following will apply:

1. Subject to clause 3, the Contractor's liability, in each of the above Maintenance Specifications, will be limited in each contract year to two occurrences of \$25,000 each and to a maximum of \$5,000 for each subsequent occurrence.
2. If the Contractor estimates that at any Emergency Site, for any single occurrence of an emergency, the cost to repair the Highway in accordance with the respective Maintenance Specifications, exceeds the financial caps in 1. above, then the following will apply:
 - a) the Contractor must immediately notify the Province and must provide an estimate, in writing, of the costs to repair the Highway;
 - b) the Contractor must continue to perform the services as set out in the applicable Maintenance Specification, or until notified by the Province to cease;
 - c) the Province may elect to do any one or more of the following:
 - i) instruct the Contractor to complete the work, or part thereof, in which case the Contractor will be entitled to payment in accordance with the terms of Part II of the Fee Schedule for the actual cost to the Contractor of completing the work that:
 1. is in excess of the financial caps in 1. above; and
 2. is included in the estimate provided under 2. a) above; or
 - ii) instruct another Contractor to complete the work, or part thereof; or
 - iii) complete the work, or part thereof.

3. In each contract year, the Contractor's combined liability for the three Maintenance Specifications listed above (*Flood Control and Washout Response*, *Mud, Earth and Rock Slide Response* and *Structure Damage Response*) will be limited to 2% of the annual contract price. The following occurrences will be credited towards the 2% cap:
 - a) all occurrences greater than \$10,000 before the two occurrences of \$25,000;
 - b) the two occurrences of \$25,000;
 - c) all occurrences up to \$5,000 after the two occurrences of \$25,000.
4. Should the Province and the Contractor mutually agree to apply Quantified Maintenance Services work credits towards an emergency event, the value of those work credits will not be included in the value of the emergency caps (\$25,000 or \$5,000) or be applied to the 2% cap.

Any Additional or Emergency Maintenance Services work over and above the stated caps will not be applied to the 2% cap.

Should the Contractor recover all or part of the cost of responding to an event through a Damage to Government Property claim, it will not be counted as an Emergency Event or count towards the 2% cap.

I. DAMAGE TO GOVERNMENT PROPERTY

All damages to Government Property will be repaired as Routine Maintenance Services regardless of whether the costs to repair those damages are recoverable by the Province from third parties or whether the Province reimburses the Contractor for any costs recovered.

All damages to Government Property caused by the Contractor are to be repaired by the Contractor as Routine Maintenance Services and will not be recoverable.

J. REFERENCED MANUALS

The following sets out a list of manuals that are referenced throughout these Maintenance Specifications and are required by the Contractor to perform the Maintenance Services. It is the Contractor's obligation to obtain these manuals and maintain them throughout the term of the Maintenance Agreement.

Canutec Emergency Response Guidebook, Transport Canada, Response and Operations Division

Manual of Standard Traffic Signs and Pavement Markings, Ministry of Transportation, September 2000 Edition

Can be accessed through the following Internet address:

http://www.th.gov.bc.ca/publications/eng_publications/eng_pubs.htm

Pavement Surface Condition Rating Manual, Ministry of Transportation, 2002

Can be accessed through the following Internet address:

http://www.th.gov.bc.ca/publications/const_maint/cmb_publications.htm

Recognized Products List, Ministry of Transportation, August 2002 Edition

Can be accessed through the following Internet address:

http://www.th.gov.bc.ca/publications/eng_publications/eng_pubs.htm

Sign Pattern Manual, Ministry of Transportation, February 2003

Can be accessed through the following Internet address:

http://www.th.gov.bc.ca/publications/eng_publications/eng_pubs.htm

Snow Avalanche Safety Measures for Highways Manual, Ministry of Transportation, 2003

Can be accessed through the following Internet address:

http://www.th.gov.bc.ca/mot_org/const_maint/snowavalanche/snow_av.htm

Specifications for Standard Highway Sign Materials, Fabrication and Supply, Ministry of Transportation, April 2003

Can be accessed through the following Internet address:

http://www.th.gov.bc.ca/publications/eng_publications/eng_pubs.htm

Standard Specifications for Highway Construction, Ministry of Transportation, 2003

To be purchased from the following Internet address:

<http://www.publications.gov.bc.ca/queries/help.html>

Or viewed at:

http://www.th.gov.bc.ca/publications/const_maint/cmb_publications.htm

Traffic Control Manual of Work on Roadways, Ministry of Transportation, 1999
Consolidated Office Edition

Can be accessed through the following Internet address:

http://www.th.gov.bc.ca/publications/eng_publications/eng_pubs.htm

Although not specifically referenced throughout these Maintenance Specifications, the Contractor should be aware of the Best Management Practices guidelines.

To be released early in 2004

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-100

HIGHWAY PAVEMENT PATCHING AND CRACK SEALING

1. OBJECTIVE

To ensure paved Highway surfaces are safe, smooth, stable, and sealed; and, to prevent moisture from penetrating the pavement surface.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must construct Temporary Patches where pavement deficiencies are unsafe or have the potential to become unsafe for Highway Users.

2.2 Quantified Maintenance Services

The Contractor must:

- a) construct Permanent patches; and
- b) seal cracks.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) construct Temporary Patches to correct pavement deficiencies such as, but not limited to:
 - i) Pot-holes;
 - ii) Bleeding;
 - iii) Distortions;
- b) ensure that finished patches are consistent with the line, grade, and crossfall of the adjacent pavement; and

- c) not remove and replace Temporary Patches with a Permanent Patch where the Temporary Patch is performing to the specifications of a Permanent Patch.

3.1.1 Performance Time Frames

- a) The following table establishes the maximum time, from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete repairs to each deficiency based on the severity rating in the Pavement Surface Condition Rating Manual:

Pavement Deficiency	Severity	Summer Highway Classification				
		1 & 2	3	4	5	6 & 7
Pot-hole on Travelled Lane or inner Shoulder of curved Highway sections	high	24 h	2 d	3 d	7 d	14 d
Pot-hole on outside Shoulder of curved Highway sections and tangents	high	3 d	7 d	10 d	21 d	45 d
Pot-hole on right edge of divided Highway in the direction of travel	high	24 h	2 d	3 d	7 d	14 d
Pot-hole on left edge of divided Highway in the direction of travel	high	3 d	7 d	10 d	21 d	45 d
Bleeding on Travelled Lane, or inside Shoulder of curved Highway sections	high	24 h	2 d	3 d	7 d	14 d
Distortions presenting a safety hazard	high	24 h	2 d	3 d	7 d	14 d

Legend

h - hours

d – days

3.2 Quantified Maintenance Services

The Contractor must:

- a) ensure that finished patches are consistent with the line, grade and crossfall of the adjacent pavement;
- b) ensure that the edges of the patch that tie in elevation to existing pavements are feathered to an angle of no less than 30 degrees from a line perpendicular to the centreline;
- c) ensure that Shoulders are built up and Compacted to match the pavement elevation and are consistent with the line, grade, and crossfall of the adjacent Shoulders;
- d) ensure that Overlay Patches are compacted to a minimum thickness of not less than 50 mm and at an average application rate of not less than 120 kilograms per square metre;
- e) ensure that patches are constructed to a depth equal to that of the distressed pavement but never less than 60 mm;
- f) ensure that the root cause of the pavement failure is determined and reasonable attempts are made to deal with the failure before commencing repairs;
- g) ensure that paved bicycle and/ or pedestrian paths adjacent to Travelled Lanes are patched as part of the Highway;
- h) ensure that paved bicycle and/ or pedestrian paths not adjacent to Travelled Lanes are maintained to the same standard as the adjacent or nearest Highway;
- i) ensure that Weigh-in-motion Sites are maintained in accordance with the Province's instructions;
- j) measure the size of the patch to include the area required to maintain a smooth, stable and safe pavement surface;
- k) seal cracks; and
- l) when crack sealing, give priority to newer pavements, Travelled Lanes and areas where the cracks have the potential to develop into other deficiencies.

3.2.1 Performance Time Frames

- a) The following table establishes the maximum time, from the time weather conditions are conducive to perform the work, within which the Contractor must complete repairs to each deficiency based on the Severity and Density ratings in the Pavement Surface Condition Rating Manual:

Pavement Deficiency	Severity	Density	Summer Highway Classification				
			1 & 2	3	4	5	6
Shoving	high	frequent	21 d	21 d	21 d	21 d	1 m
Distortion	high	frequent	21 d	21 d	1 m	3 m	6 m
Aligatored areas without Distortion	moderate	frequent	21 d	1 m	3 m	6 m	1 y
Aligatored areas with Distortion, broken or missing materials	high	frequent	21 d	21 d	1 m	3 m	6 m
Pot-holes	low	through out	21 d	21 d	1 m	3 m	6 m
Bleeding	moderate	frequent	21 d	21 d	1 m	3 m	6 m
Ravelling	high	extensive	21 d	1 m	3 m	6 m	1 y
Rutting	moderate	extensive	21 d	21 d	1 m	3 m	6 m
all Longitudinal Cracking	moderate	frequent	1 y	1 y	1 y	1 y	1 y
Pavement Edge Cracking	moderate	frequent	1 y	1 y	1 y	1 y	1 y
Transverse Cracking	moderate	any	1 y	1 y	1 y	1 y	1 y

Legend

d - days

m - months

y – years

Note: For the purposes of calculating Density in the above table, the length of the section to be rated will be 20 metres and will start at the beginning of the deficiency and continue in the direction of traffic flow.

- b) The Contractor must plan to perform all identified Permanent Patches and crack sealing within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

The Contractor warrants all Permanent Patches against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-110

HIGHWAY SURFACE TREATMENT

1. OBJECTIVE

To provide safe, durable, dust-free, impermeable travelling surfaces that facilitate the safe and efficient movement of traffic; and to protect the underlying infrastructure.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

The Contractor must:

- a) treat paved and Sealed roads where Ravelling, weathering, fatigue, traction-loss or other surface deficiencies are present; and
- b) treat gravel surfaces where there is a need to provide a dust-free durable surface.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.1.1 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor must:

- a) prepare roads prior to surface treatment;
- b) complete any required Road Base repairs in accordance the Maintenance Specification for *Road Base Maintenance*, with credit

for such work under the Maintenance Specification for *Road Base Maintenance*;

- c) patch paved Highway surfaces as required to provide a smooth and stable base in accordance with the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*, with credit for such work under the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*;
- d) Re-shape gravel surfaces as required to prepare the base in accordance with the Maintenance Specification for *Grading and Re-shaping*, with credit for such work under the Maintenance Specification for *Grading and Re-shaping*; and
- e) haul and place additional gravel as required in accordance with the Maintenance Specification for *Highway Surface and Shoulder Gravelling*, with credit for such work under the Maintenance Specification for *Highway Surface and Shoulder Gravelling*.

3.2.1 Performance Time Frames

The Contractor must plan to perform all identified surface treatment within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

The Contractor warrants all Highway surface treatment against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-130

GRAVEL SURFACE GRADING AND RE-SHAPING

1. OBJECTIVE

To maintain Dirt and Gravel Highway surfaces in a safe and stable condition and to promote efficient drainage.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

The Contractor must:

- a) perform Re-shaping where the Crown and Superelevation of the Dirt and Gravel Highway requires re-establishment to protect Highway Users from situations that are unsafe or have the potential to become unsafe; and
- b) perform surface Grading where surface deformities exist and where the Crown and Superelevation of the Dirt and Gravel Highway require re-working to protect Highway Users from situations that are unsafe or have the potential to become unsafe.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.1.1 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor must:

- a) perform Re-shaping to ensure the surface is smooth and Compacted;
- b) perform Re-shaping to ensure that the surface will
 - i) have a Superelevation;
 - ii) have a Crown with a vertical rise of 4 centimetres for every 1 metre of Dirt and Gravel Highway surface;
- c) perform Re-shaping to ensure that lost materials are retrieved from the Shoulder side slopes;
- d) perform Grading to ensure that the surface is smooth and stable;

3.2.1 Performance Time Frames

- a) The following table establishes the maximum time from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

Gravel Surface Deficiencies		Summer Highway Classification			
		3 & 4	5	6	7
i)	Pot-hole (average more than 1 per 25 metres of road), Rutting, Ponding and Wash-boarding (exceeding 30 mm depth)	2 d	3 d	6 d	15 d
ii)	loss of aggregates (needs reclaimed material)	4 d	5 d	15 d	30 d
iii)	1) lack of uniform Shoulder edge 2) loose material (exceeding 50 mm depth)	5 d	15 d	1 m	2 m

Legend

d – days

m – months

- b) In situations of significant public and stakeholder demands for Maintenance Services required under this Specification, the Contractor must provide an immediate response at an appropriate level; and
- c) The Contractor must plan to perform all identified Grading and Re-shaping within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Not applicable to this Maintenance Specification.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-140

DUST CONTROL AND BASE STABILIZATION

1. OBJECTIVE

To maintain Dirt and Gravel Highway surfaces in a stable condition with minimal dust which will facilitate the safe and efficient movement of traffic and protect adjacent properties and watercourses.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must re-apply dust palliative product as required by this Specification at locations where dust palliative products have been applied previously within the season.

2.2 Quantified Maintenance Services

The Contractor must:

- a) apply dust palliative product to control dust; and
- b) supply maintenance services to perform base stabilization.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must re-apply dust palliative product as required to prevent and/or minimize dust problems at dust sites treated previously in the season.

3.1.1 Performance Time Frames

The Contractor must re-apply a dust palliative product within a maximum of 2 days from the time the dust problem was detected by or reported to the Contractor.

3.2 Quantified Maintenance Services

The Contractor must:

- a) prepare the section of the Dirt and Gravel Highway to receive base stabilization by Re-shaping in compliance with the Maintenance Specification for *Gravel Surface Grading and Re-shaping*, with no credit for Re-shaping under the Maintenance Specification for *Gravel Surface Grading and Re-shaping*;
- b) carry out base stabilization by treating the entire Dirt and Gravel Highway surface, except for one metre on each side;
- c) maintain Dirt and Gravel Highway surfaces in a stable condition with minimal dust by applying dust palliative product for widths, distances and at locations established in the following table:

	Summer Highway Classification		
i) Width	3 & 4	5	6
minimum application width (total)	4.5 metres	3.5 metres	3.0 metres
ii) Location for Control	3 & 4	5	6
(A) residences, commercial businesses, community halls, hospitals and churches	a strip not less than 100 metres long, 50 metres each side of a point perpendicular to a building within 100 metres of the Travelled Lane	a strip not less than 100 metres long, 50 metres each side of a point perpendicular to a building within 75 metres of the Travelled Lane	a strip not less than 100 metres long, 50 metres each side of a point perpendicular to a building within 50 metres of the Travelled Lane
(B) school zone Sign, playground Sign, stop Sign, Railway Crossing Sign and Bridge approaches Sign	strip 60 metres along the Highway(s) in all directions of the Sign	strip 60 metres along the Highway(s) in all directions of the Sign	strip 60 metres along the Highway(s) in all directions of the Sign
(C) school zones, school bus pullouts, playgrounds, Rest Areas, lay-bys, stops of interest and cemeteries	strip through identified area and extending 40 metres either side	strip through identified area and extending 40 metres either side	strip through identified area and extending 40 metres either side
(D) Bridge approaches and cattleguards	strip extending 30 metres in every direction of the Bridge approach	strip extending 30 metres in every direction of the Bridge approach	strip extending 30 metres in every direction of the Bridge approach

ii) Location for Control		3 & 4	5	6
(E)	orchards (more than 10 trees) and vineyards within 50 metres of the Highway	strip extending 20 metres either side of the adjacent Highway frontage	strip extending 20 metres either side of the adjacent Highway frontage	strip extending 20 metres either side of the adjacent Highway frontage
(F)	Highways with 40 or more commercial and industrial-type vehicles per day with 3 or more axles	entire Travelled Lanes	curves and alongside lakes and rivers	curves and alongside lakes and rivers
(G)	other dust sites designated by the Province	continuous application for entire length of dust site	continuous application for entire length of dust site	continuous application for entire length of dust site

Notes:

1. Each of the locations identified in the above table is considered a dust site.
2. Use continuous application if 8 or more dust sites per kilometre.
3. Where there is doubt as to locations requiring dust control, the Province will make the final determination.
4. Dust control must be applied at locations on Class 7 Highways as directed by the Province.

3.2.1 Performance Time Frames

The Contractor must:

- a) schedule dust control applications for each season prior to commencement of that season;
- b) start dust control applications within 5 days from the time the dust problem was detected by or reported to the Contractor; and
- c) plan to perform all identified dust control and base stabilization within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities the Contractor must ensure repairs are identified and carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

The Contractor warrants all base stabilization against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-150

HIGHWAY SURFACE AND SHOULDER GRAVELLING

1. OBJECTIVE

To provide a uniform, smooth gravel surface to protect Highway Users from unsafe conditions and to strengthen roads.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

The Contractor must:

- a) apply gravel to Dirt and Gravel Highways to ensure a smooth condition with sufficient gravel depth to restore Superelevation and proper Crown;
- b) apply gravel to Dirt and Gravel Highways that require strengthening;
- c) apply gravel to Shoulders to widen and/or reconstruct existing gravel Shoulders where Shoulder settlement or erosion exists for a continuous length greater than 100 metres; and
- d) ensure all surfaces are Compacted.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.1.1 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor must:

- a) repair deficiencies, including but not limited to Pot-holes, loss of traction, soft sections and Rutting, as required on Dirt and Gravel Highway surfaces;
- b) repair Dirt and Gravel Highway surfaces that:
 - i) become soft and muddy;
 - ii) have insufficient aggregate which causes clay or Fines to be exposed, or causes bedrock or rocks, that cannot be removed, to be exposed during Grading; and/or;
 - iii) have insufficient aggregate available to restore the Crown and/or the Superelevation when Grading in accordance with the Maintenance Specification for *Gravel Surface Grading and Re-shaping*.
- c) apply gravel to Dirt and Gravel Highway surfaces that have not been previously gravelled and/or require strengthening;
- d) widen or re-construct existing gravel Shoulders, where Shoulder settlement or erosion exists for a continuous length greater than 100 metres, to a condition that is smooth, free-draining, and consistent in width, line, grade and crossfall;
- e) perform all Grading associated with Sections 3.2 a), b), c) and d) above in accordance with the Maintenance Specification for *Gravel Surface Grading and Re-shaping* with no credit for this Grading under the Maintenance Specification for *Gravel Surface Grading and Re-shaping*;
- f) evaluate the Dirt and Gravel Highway to be gravelled to ensure that the Road Base is stable and where it is unstable, repair the area in accordance with the Maintenance Specification for *Road Base Maintenance*, prior to undertaking Highway surface gravelling, with credit for this work under the Maintenance Specification for *Road Base Maintenance*.

Note:

The Contractor must provide the Province with information necessary to support the method used to determine volume of aggregate hauled.

3.2.1 Performance Time Frames

The following table establishes the maximum time, from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

a) gravel surface deficiencies

Gravel Surface Deficiency	Summer Highway Classification				
	3	4	5	6	7
i) Pot-holes	2 d	2 d	3 d	6 d	15 d
ii) surface soft and/or muddy	24 h	2 d	3 d	6 d	15 d
iii) loss of traction	24 h	2 d	3 d	6 d	15 d
iv) surface softening when wetted	30 d	2 m	6 m	9 m	1 y
v) insufficient surfacing aggregate	30 d	2 m	6 m	9 m	1 y

b) Shoulder surface deficiencies

Shoulder Surface Deficiency	Summer Highway Classification				
	1 & 2	3	4	5	6 & 7
i) loose or soft Shoulders	14 d	30 d	45 d	3 m	6 m
ii) loss of line, grade, and crossfall	3 m	6 m	9 m	1 y	1 y

Legend

h - hours
d - days
m - months
y – years

- c) The Contractor must plan to address all identified gravelling within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities the Contractor must ensure repairs are identified and carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-160

HIGHWAY SHOULDER MAINTENANCE

1. OBJECTIVE

To provide a smooth and safe stopping area with free-flowing drainage off the Travelled Lanes and through the Road Base.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

The Contractor must:

- a) maintain Highway Shoulders in a condition that is safe, smooth, stable, free-draining, Compacted, free of vegetation; and
- b) repair Highway Shoulders that have been damaged by erosion, settlement or traffic use when the deficiencies are site-specific and less than 100 m in length.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.1.1 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor must:

- a) control, remove and dispose of any vegetation from the Shoulder tops, except at locations where vegetation is not harmful, or where it is effective and necessary to prevent erosion and to stabilize the Shoulders;
- b) repair Shoulders that have settled or eroded and place sub-surface materials in accordance with the Maintenance Specification for *Road Base Maintenance*, with credit for this work under the *Road Base Maintenance* Specification;
- c) ensure the Shoulder tops are Compacted;
- d) correct Shoulder deficiencies such as settlements and eroded areas where such deficiencies are less than 100 m in continuous length;
- e) perform all Grading associated with 3.1 d) above in accordance with the Maintenance Specification for *Gravel Surface Grading and Re-shaping* with credit for this Grading under the Maintenance Specification for *Gravel Surface Grading and Re-shaping*;
- f) remove any granular or other material from the pavement surface in accordance with the Maintenance Specification for *Pavement Surface Cleaning* with no credit for this cleaning under the Maintenance Specification for *Pavement Surface Cleaning*;
- g) repair paved and treated Shoulder tops on paved Highways in accordance with the Maintenance Specification for *Highway Pavement Patching and Crack Sealing* with credit for this patching under the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*; and
- h) widen, reconstruct or gravel the Shoulders in areas of continuous Shoulder settlement or erosion greater than 100 m in continuous length in accordance with the Maintenance Specification for *Highway Surface and Shoulder Gravelling* with credit for this gravelling under the Maintenance Specification for *Highway Surface and Shoulder Gravelling*.

Notes:

- 1. The Contractor will not grade the area where there is a Median, Roadside barrier or curbing between the pavement and the gravel Shoulder top; and

2. The Contractor will not undertake *Highway Shoulder Maintenance* where owners of property adjacent to Highways maintain a lawn up to the edge of the pavement provided the lawn does not impede the drainage of the Highway surface.

3.2.1 Performance Time Frames

Not applicable to this Maintenance Specification.

- a) The following table establishes the maximum time, from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

Shoulder Surface Deficiency	Summer Highway Classification				
	1&2	3	4	5	6&7
i) pavement edge drop-off 5 cm or more in depth on the inside edge of curving Highways	24 h	24 h	3 d	7 d	14 d
ii) pavement edge drop-off 5 cm or more in depth other than a) above	3 d	3 d	6 d	14 d	14 d
iii) settled and eroded sections more than 5 cm in depth presenting a safety hazard	3 d	3 d	6 d	14 d	14 d
iv) loose or soft Shoulders presenting a safety hazard	3 d	3 d	6 d	14 d	14 d
v) loss of line, grade, and crossfall presenting a safety hazard	3 d	3 d	6 d	14 d	14 d
vi) removal of vegetation presenting a safety hazard	3 d	3 d	6 d	14 d	14 d
vii) loss of line, grade and crossfall not presenting a safety hazard but requiring gravelling	3 m	3 m	9 m	1 y	1 y
viii) removal of turf, Sod and other vegetation	6 m	6 m	6 m	1 y	1 y
ix) prevent vegetation growth	1 y	1 y	---	---	---

Legend

h - hours

d – days

m - months

y – years

- b) The Contractor must plan to address all identified Shoulder maintenance within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities the Contractor must ensure repairs are identified and carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction of these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-170

ROAD BASE MAINTENANCE

1. OBJECTIVE

To provide a supporting structure and drainage for Highway surfaces.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

The Contractor must remove unsuitable materials in areas where Road Bases have failed to provide adequate strength and drainage to support imposed vehicle loading, as evidenced by surface deficiencies; and re-construct Road Bases with suitable materials.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.1.1 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor must:

- a) identify and correct the source of Road Base failure;
- b) remove unsuitable materials;
- c) provide free drainage from excavation;
- d) complete Backfill with suitable materials;

- e) compact materials in accordance with the Standard Specifications for Highway Construction;
- f) use material consistent with adjacent Highway materials;
- g) apply dust palliative products on Dirt and Gravel Highways in accordance with the Maintenance Specification for *Dust Control and Base Stabilization*, with no credit for dust control under the Maintenance Specification for *Dust Control and Base Stabilization*;
- h) restore Hard Surfaced Highways in accordance with the Maintenance Specifications for *Highway Pavement Patching and Crack Sealing, Highway Surface Treatment and Concrete Bridge Deck Maintenance*, with credit for such work under the aforementioned Maintenance Specifications; and
- i) install drainage appliances in accordance with the Maintenance Specification for *Drainage Appliance Maintenance*, with credit for such drainage appliance maintenance under the Maintenance Specification for *Drainage Appliance Maintenance*.

3.2.1 Performance Time Frames

The Contractor must plan to perform all identified Road Base repairs within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities the Contractor must ensure repairs are identified and carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

The Contractor warrants all Road Base repairs against defects for a period of 365 days from the completion of those maintenance services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-180

PAVEMENT SURFACE CLEANING

1. OBJECTIVE

To protect Highway Users from unsafe pavement surface conditions and to facilitate drainage.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must restore pavement surfaces to a safe, clean and free-draining condition.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) clean Hard Surfaced Highways by removing accumulations of dirt, Debris, sand and/or gravel from the Travelled Lanes, centerlines, Shoulders, curbs, intersections, traffic islands and along Medians and/or Roadside barriers throughout the year to provide a safe, clean, free-draining condition;
- b) clean paved bicycle and pedestrian paths; and
- c) ensure that traffic control is implemented in accordance with the Manual for Traffic Control and Work on Roadways during pavement cleaning operations so that hazardous conditions are not created for Highway Users.

3.1.1 Performance Time Frames

The Contractor must:

- (a) clean Hard Surfaced Highways in accordance with the frequencies established in the following table:

Routes and Highway Classification	Minimum Pavement Surface Cleaning Frequency
(i) all four lane and Urban Highways	every 120 days
(ii) all other Hard Surfaced Highways	once annually

- (b) program for major pavement marking, for which the Province will provide a general painting schedule in the spring of each year and a detailed schedule at least one week in advance of line marking;
- (c) complete spring surface cleaning of Hard Surfaced Highways within 1 month of the last winter abrasive application or when the application of Winter Abrasives is no longer anticipated;
- (d) notwithstanding the above, within 7 days from the time the accumulation was detected by or reported to the Contractor, clean Hard Surfaced Highways where dirt, Debris, sand and/or gravel have accumulated and:
 - i) obscures line visibility, or;
 - ii) creates a visibility problem for Highway Users, or;
 - iii) creates an air quality problem that conflicts with local by-laws;
- (e) notwithstanding the above, perform cleaning work where sand and silt have accumulated adjacent to curbing or barriers which impairs the free flow of drainage paths in accordance with the Performance Time Frames in the Maintenance Specification for *Curb, Island and Barrier Maintenance*, with no credit for such work under the Maintenance Specification for *Curb, Island and Barrier Maintenance*;

- (f) notwithstanding the above, immediately, upon detection by or notification to the Contractor, remove any dirt, Debris, sand and/or gravel on paved surfaces which pose a hazard to Highway Users; and
- (g) clean paved bicycle and pedestrian paths in accordance with the Performance Time Frames and other applicable conditions as per the adjacent or nearest Highway.

3.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3.3 Materials

Not applicable to this Maintenance Specification.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-190

DEBRIS REMOVAL

1. OBJECTIVE

To protect Highway Users from situations that are unsafe or have the potential to become unsafe.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain the Travelled Lanes, Shoulders, and Roadsides in a safe and unobstructed condition.

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 Debris in accordance with the Performance Time Frames set out in Section 3.1.1;
- b) if the Debris is too large for immediate removal, secure the area in accordance with the Maintenance Specification for *Highway Traffic Control*;
- c) establish additional patrols through the area when Debris over 1000 cc on the Travelled Lanes, Shoulders, and sidewalks is detected or reported to the Contractor more than once in a 24 hour period so that Debris is removed within the Performance Time Frames specified in Section 3.1.1, and discontinue the additional patrols when the frequency of Debris over 1000 cc falling on the Travelled Lanes, Shoulders, and sidewalks is less than 2 in a 24 hour period;

- d) dispose of dead animals in a manner acceptable to local regulatory agencies.

Note: For volumes of Debris on Travelled Lanes or Shoulders that are greater than 10 cubic metres per location, the Maintenance Specification for *Mud, Earth and Rock Slide Response* will apply.

3.1.1 Performance Time Frames

The following table establishes the maximum time, from the time the Debris was detected by or reported to the Contractor, within which the Contractor must start the removal of Debris:

Obstruction		Summer Highway Classification				
		1&2	3	4	5	6&7
a)	Debris or spilled material over 1000 cc on the Travelled Lanes and sidewalks	60 min	60 min	3 h	5 h	24 h
b)	Debris or spilled material equal to or less than 1000 cc on the Travelled Lanes and sidewalks	60 min	3 h	5 h	24 h	2 d
c)	dead animals on the Shoulders and sidewalks	60 min	3 h	5 h	24 h	2 d
d)	dead animals on the Right-of-way, excluding Travelled Lanes, Shoulders and sidewalks	3 h	5 h	24 h	2 d	3 d
e)	Debris or spilled material more than 1000 cc on the Shoulders	5 h	24 h	2 d	3 d	7 d
f)	Debris or spilled material equal to or less than 1000 cc on the Shoulders	24 h	2 d	3 d	7 d	14 d

Legend

min - minutes
h - hours
d - days

3.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3.3 Materials

Not applicable to this Maintenance Specification.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-200

HIGHWAY STRUCTURES MAINTENANCE

1. OBJECTIVE

To provide a safe environment for Highway Users and to maximize the functional life of the Highway structures.

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) repair, clean and restore to a fully functional condition, cattleguards and gates, pedestrian underpasses, arrestor beds, Dragnet Vehicle Arresting Barriers and other Highway structures that have been damaged or have deteriorated to a state that is unsafe or has the potential to become unsafe for Highway Users;
- b) remove dirt, Debris and vegetation from cattleguards to a minimum depth of 45 cm measured from the top of the cattleguards;
- c) maintain all Underpass floors and walls, ramp walls, sidewalks, stairways and walkways free of all dirt, grime and winter chemicals;
- d) maintain Underpass walls in a uniformly-painted condition using paint materials and colours approved in writing by the Province;
- e) maintain pedestrian underpass lighting in Rural areas in a lights-on condition during all hours of darkness;

- f) maintain arrestor beds in accordance with the Province's written instructions as may be amended from time to time for the particular structure or installation;
- g) repair or replace Dragnet Vehicle Arresting Barrier components that have been damaged, destroyed or are missing;
- h) maintain concrete Highway structures in accordance with the Maintenance Specification for *Concrete Structure Maintenance*, with credit for the concrete patching under the Maintenance Specification for *Concrete Structure Maintenance*;
- i) maintain corrugated steel Highway structures in accordance with the Maintenance Specification for *Multiplate Structure Maintenance*, with no credit for the work under the Maintenance Specification for *Multiplate Structure Maintenance*; and
- j) maintain asphalt components of Highway structures in accordance with the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*, with credit for the patching under the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*.

3.1.1 Performance Time Frames

The following table establishes the maximum time, from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

Maintenance Requirement	Summer Highway Classification				
	1 & 2	3	4	5	6 & 7
a) Debris on sidewalks, stairways and Underpass floors	24 h	24 h	2 d	2 d	2 d
b) any malfunction to arrestor beds	24 h	24 h	2 d	2 d	2 d
c) damaged, destroyed or missing components of Dragnet Vehicle Arresting Barriers	3 d	3 d	3 d	3 d	3 d
d) broken, bent or damaged cattleguards	24 h	2 d	3 d	5 d	10 d

Maintenance Requirement	Summer Highway Classification				
	1 & 2	3	4	5	6 & 7
e) mismatched grades on cattleguard crossings	24 h	2 d	3 d	5 d	10 d
f) cleaning of cattleguards	15 d	15 d	30 d	30 d	30 d
g) lights out in pedestrian Underpasses	2 d	4 d	6 d	10 d	20 d
h) walls requiring patching or support	10 d	20 d	30 d	50 d	100 d
i) sand accumulations on sidewalks, stairways, walkways and Underpass floors	30 d	2 m	3 m	5 m	10 m

Legend

h - hours

d - days

m - months

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

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-220

CURB, ISLAND AND BARRIER MAINTENANCE

1. OBJECTIVE

To provide a safe operating environment for Highway Users and to allow for adequate drainage.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain and repair all curbs, traffic islands, Roadside barriers and Median barriers, anti-glare screen, reflectors and impact attenuators to ensure that they are clean, highly visible, free of any Debris obstructing drainage and properly connected and positioned as safety devices.

2.2 Quantified Maintenance Services

The Contractor must:

- a) replace all curbs, traffic islands, Roadside barriers and Median barriers, anti-glare screens, reflectors and impact attenuators that fail to function as originally designed;
- b) construct new asphalt and/or concrete curbs as directed by the Province; and
- c) install new barriers as directed by the Province.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) maintain painted surfaces;
- b) repair chipped or scarred areas;

- c) remove dirt and Debris every spring to summer season when temperatures are above 5 degrees celsius and no further winter Highway maintenance is reasonably expected;
- d) re-align barriers as required to ensure safety of the Highway Users; and
- e) remove drainage obstructions as required throughout the year.

3.1.1 Performance Time Frames

The Contractor must:

- a) start repair of concrete barriers with damage of less than 900 square centimetres of surface area using material of the same type and quality as the existing installation, or by using an epoxy repair product approved in writing by the Province, within 3 days from the time the deficiency was detected by or reported to the Contractor;
- b) clean all drainage holes once annually to ensure the free passage of water;
- c) notwithstanding 3.1.1 b) above:
 - i) when a blockage is causing Ponding in the Travelled Lanes, clean affected drainage holes of Debris within 12 hours from the time the deficiency was detected by or reported to the Contractor;
 - ii) when a blockage is causing a situation that is unsafe or has the potential to become unsafe to the Highway User, clean affected drainage holes of Debris immediately;
- d) complete the realignment of rails, curbs and concrete barriers as required to restore the designed alignment within 3 days from the time the deficiency was detected by or reported to the Contractor;
- e) treat or paint all wood components every 2 years to protect them from the elements, with the same material as on the existing components; notwithstanding the aforementioned, the Contractor must treat or paint wood components where wood is exposed or paint is cracked within 9 months from the time the deficiency was detected by or reported to the Contractor;

- f) paint end sections of concrete barrier with the same material as on the existing component once each year or, with prior written approval of the Province, initiate a planned program to eradicate paint on these components as they deteriorate;
- g) undertake maintenance of areas chipped or scarred by snowplows, other equipment or vandalism within 90 days from the time the deficiency was detected by or reported to the Contractor;
- h) replace damaged or missing concrete barrier reflectors in accordance with the Maintenance Specification for *Sign System Maintenance*, with no credit for the replacements under the Maintenance Specification for *Sign System Maintenance*;
- i) repair or replace all wood and steel components if posts are rotted, broken, settled or damaged and/or if steel rail is bent, rusted or damaged, within 6 months from the time the deficiency was detected by or reported to the Contractor;
- j) restore a smooth, stable condition to broken or Pot-holed asphalt, rock-paved or bricked traffic island surfaces within 15 days from the time the deficiency was detected by or reported to the Contractor;
- k) replace damaged, destroyed and missing impact attenuators, supports or fasteners within a 3 days from the time the deficiency was detected by or reported to the Contractor; and
- l) replace damaged, destroyed and missing anti-glare screen components within 7 days from the time the deficiency was detected by or reported to the Contractor.

3.2 Quantified Maintenance Services

The Contractor must:

- a) construct new asphalt concrete curb and concrete curb; and
- b) replace concrete barriers with damage in excess of 900 square centimetres or where there is structural damage including cracking and/or breakage.

3.2.1 Performance Time Frames

- a) The Contractor must repair or replace cracked and broken curbs as required to provide a smooth, sound and interconnected curb within 15 days from the time the deficiency was detected by or reported to the Contractor; and
- b) The Contractor must plan to perform all identified curb and barrier replacements and installations within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities the Contractor must ensure repairs are identified and carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 1-230

RAILWAY CROSSING MAINTENANCE

1. OBJECTIVE

To keep vehicular crossings of railway tracks in a safe condition for Highway Users and ensure proper operation of the railway.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must:

- a) repair Railway Crossing surfaces under the direction of the Railway Authority and in accordance with the Railway Crossing agreement with the Province;
- b) maintain Railway Crossing Approaches in accordance with the following protocol requirements:
 - i) when maintenance work is required within three (3) metres of a rail, the Contractor must obtain a permit from the Railway Authority and make a copy of the permit available at the work site and at the local Ministry district office upon commencement of the work;
 - ii) when maintenance work is required within ten (10) metres of a rail, the Contractor must inform the Railway Authority, arrange for a mutually-agreeable work schedule and ascertain the level of protection the Railway Authority considers necessary; and
 - iii) when the Railway Authority performs maintenance work that is a cost responsibility of the Province, the Contractor must pay the Railway Authority invoices for such work and will not be reimbursed by the Province.

2.2 Quantified Maintenance

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) advise the Railway Authority immediately, from the time any deficiency was detected by or reported to the Contractor and respond immediately to safeguard Highway Users and railway traffic;
- b) under the direction of the Railway Authority, repair all Railway Crossings where the Province is responsible for a portion of the Railway Crossing maintenance costs (these Railway Crossings are listed in RIMS), and when:
 - i) the difference in elevation between the rail and the adjacent Highway surface is 25 mm or greater and requires re-setting the surface to matching grade; or when a crossing component is loose or presents a condition that is unsafe for either Highway Users or rail traffic; or
 - ii) water or Debris accumulates at the Railway Crossing;
- c) reset Railway Crossings and Approaches in accordance with the following:
 - i) the Maintenance Specification for *Highway Pavement Patching and Crack Sealing* for Hard Surfaced Highways, with no credit under the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*; or
 - ii) the Maintenance Specification for *Highway Surface and Shoulder Gravelling* for Dirt and Gravel Highways, with no credit under the Maintenance Specification for *Highway Surface and Shoulder Gravelling*.

3.1.1 Performance Time Frames

The following table establishes the time, from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

Railway Crossing Deficiency	Summer Highway Classification				
	1&2	3	4	5	6&7
a) repair of broken, loose or damaged Railway Crossings	24 h	2 d	3 d	5 d	10 d
b) repair of mismatched grades on Railway Crossing	24 h	2 d	3 d	5 d	10 d
c) removal of water accumulation	24 h	2 d	3 d	5 d	10 d

Legend

h - hours

d - days

Note: The Contractor must seek approval of the Railway Authority so that repairs are completed within the time frames listed above. If the Railway Authority does not permit this scheduling, the Contractor must reschedule the repairs in accordance with the Railway Authority's requirements.

3.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

The Contractor must provide all materials of at least equal quality to the materials that exist at the Railway Crossing and of a quality acceptable to the Railway Authority.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 2-250

DITCH AND WATERCOURSE MAINTENANCE

1. OBJECTIVE

To provide safe, unobstructed drainage for all Highway surface runoffs, natural Roadside runoffs and ditches; and to create a collection area for Debris and ice and snow.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must clean and remove Debris from ditches and watercourses where earth moving equipment is not required.

2.2 Quantified Maintenance Services

The Contractor must:

- a) clean ditches and watercourses using earth moving equipment;
- b) remove Debris, Debris Dams and sloughs from ditches and watercourses using earth moving equipment;
- c) repair damage to embankments and Backslopes caused by erosion using earth moving equipment;
- d) restore and/or correct the cross section and grade of ditches and watercourses using earth moving equipment; and
- e) construct new ditches or reconstruct ditches using earth moving equipment.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) hand-clean ditches and watercourses; and
- b) notify the Province of any obstructions to water flow which threaten the integrity of the Highway;

3.1.1 Performance Time Frames

- a) The following establishes the maximum time, from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

	Summer Highway Classification				
	1&2	3	4	5	6&7
during high water flow	60 min	90 min	2 h	3 h	4 h
at other times	2 m	3 m	4 m	6 m	6 m

Legend

min – minutes

h - hours

d – days

m - months

- b) The Contractor must notify the Province immediately of any obstructions to water flow which threaten the integrity of the Highway.

3.2 Quantified Maintenance Services

The Contractor must:

- a) remove obstructions preventing the free flow of water, including obstructions which may be a considerable distance upstream from the Highway, adjacent to the Highway or immediately downstream;
- b) restore the capacity and/or profile of the ditch;

- c) clean ditches;
- d) repair and stabilize Backslopes where a watercourse has caused erosion;
- e) restore ditch elevations below the bottom elevation of the sub-base to ensure free drainage of the Highway;
- f) widen and deepen ditches at culvert entrance locations, other drainage appliance or structure locations, to provide a collection area and prevent the culvert or other drainage appliance or structure from becoming obstructed;
- g) when correcting the ditch profile, re-set or replace drainage appliances in accordance with the Maintenance Specification for *Drainage Appliance Maintenance*, with credit for such work under the Maintenance Specification for *Drainage Appliance Maintenance*;
- h) clean Off-takes and drainage easements to ensure efficient drainage of the Right-of-way;
- i) ensure that Shoulder width is not reduced or undermined during the provision of the services; and
- j) dispose of waste material from ditching operations in a manner and location that complies with applicable legislation and regulations.

Notes:

1. The Contractor is not required to establish new ditches in solid rock under this Maintenance Specification.
2. The Contractor will not get credit under this Maintenance Specification for removing snow and ice from ditches.

3.2.1 Performance Time Frames

- a) The following table establishes the maximum time, from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

	Summer Highway Classification				
	1&2	3	4	5	6&7
during high water flow	60 min	90 min	2 h	3 h	4 h
other times	2 m	3 m	4 m	6 m	6 m

Legend

min - minutes

h - hours

m – months

- b) The Contractor must plan to perform all identified ditch and watercourse maintenance within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities the Contractor must ensure repairs are identified and carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Not applicable to this Maintenance Specification.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 2-260

DRAINAGE APPLIANCE MAINTENANCE

1. OBJECTIVE

To ensure that Highway surfaces are safe and efficiently drained; water is efficiently channelled, contained and/or carried to ditches and watercourses; to prevent any erosion of Highways and/or adjacent properties; and to ensure that drainage appliances will accommodate peak runoff.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must clean and repair drainage appliances.

2.2 Quantified Maintenance Services

The Contractor must replace existing or install new drainage appliances.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) remove Debris, winter abrasive, and sedimentation from drainage appliances;
- b) maintain all Highway drainage appliances, trash racks and related hardware in working condition;
- c) repair any worn, bent, broken, folded, disconnected, unravelled or damaged drainage appliances; and
- d) maintain biofiltration systems as specified in Local Area Specifications.

3.1.1 Performance Time Frames

- a) The following table establishes the maximum time from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must start the removal of obstructions and repair to drainage appliances during periods of high water flow:

Summer Highway Classification				
1&2	3	4	5	6&7
2 h	4 h	8 h	16 h	32 h

Legend

h – hours

- b) The following table establishes the maximum time from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must start the removal of obstructions and repair to drainage appliances at times other than listed in 3.1.1 a):

Summer Highway Classification		
1&2	3	4, 5, 6 & 7
3 m	4 m	6 m

Legend

m – months

- c) Notwithstanding 3.1.1 b), the Contractor must remove any obstruction or repair a damaged drainage appliance having a reduction in water flow capacity of 50 percent or more, or where there is a history of drainage problems, within seven days from the time the deficiency was detected by or reported to the Contractor.

3.2 Quantified Maintenance Services

The Contractor must:

- a) replace any missing appliances and/or any worn, bent, broken, or damaged appliances including appurtenances, if repair is not practicable;

- b) if patching is not practicable, replace damaged asphalt curbs, flumes and spillways, in accordance with the Maintenance Specification for *Curb, Island and Barrier Maintenance*, with credit for replacement under the Maintenance Specification for *Curb, Island and Barrier Maintenance*;
- c) install new drainage appliances;
- d) place Rip-rap to fill Scour and erosion of foundation material and to prevent future erosion at the inlet and/or outlet of the drainage appliance as approved in writing by the Province and in accordance with the Maintenance Specification for *Shore, Bank and Watercourse Maintenance*, with credit for the Rip-rap under the Maintenance Specification for *Shore, Bank and Watercourse Maintenance*, and

Note: If it is estimated by the Contractor and confirmed by the Province that at any particular time and at any particular drainage appliance, the cost of the repair exceeds \$35,000, refer to Section G of the Introduction to these Maintenance Specifications.

3.2.1 Performance Time Frames

- a) The following table establishes the maximum time from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must start to replace drainage appliances during periods of high volume water flow:

Summer Highway Classification				
1&2	3	4	5	6&7
2 h	4 h	8 h	16 h	32 h

Legend

h – hours

- b) The following table establishes the maximum time from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must start to replace drainage appliances at times other than stated in 3.2.1 a):

Summer Highway Classification		
1&2	3	4,5,6&7
3 m	4 m	6 m

Legend

m – months

- c) Notwithstanding the 3.2.1 b), the Contractor must replace a damaged drainage appliance having a reduction in water flow capacity of 50 percent or more, or where there is a history of drainage problems, within seven days from the time the deficiency was detected by or reported to the Contractor.
- d) The Contractor must plan to perform all identified drainage appliance replacements and installations within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities the Contractor must ensure repairs are identified and carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B1 of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 2-270

SHORE, BANK AND WATERCOURSE MAINTENANCE

1. OBJECTIVE

To ensure Highways are safe; and to prevent or repair damage to the Highway and its structures.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

a) The Contractor must remove obstructions, beaver dams and Debris from natural and man-made shores, banks and watercourses that reduce the capacity of the watercourses to the extent that it threatens or could threaten the integrity of the Highway.

2.2 Quantified Maintenance Services

The Contractor must place Rip-rap where there has been or there is potential for Scour and erosion of natural or man-made shores and their banks.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) remove all obstructions, beaver dams and Debris that threaten to break open and cause excessive channel flow or Debris Flows with resultant damage to the Highway and its structures;
- b) remove all trees leaning toward the watercourse and threatening to fall into the water;
- c) provide for adequate catchment areas for future material containment;
- d) dispose of all removed Debris in a manner acceptable to local regulatory agencies;

- e) inspect Highways and structures during periods of heavy rainfall or rapid melting to ensure watercourses are contained and shores and banks are not being Scoured or eroded; and
- f) prepare areas to receive Rip-rap.

3.1.1 Performance Time Frames

The Contractor must:

- a) immediately, upon detection by or notification to the Contractor that a shore or bank is being eroded, a watercourse is not contained or there is a likelihood it will not be contained, initiate traffic control necessary to protect Highway Users and initiate Highway closure procedures, if necessary, in accordance with the Maintenance Specification for *Highway Traffic Control*; and
- b) remove upstream obstructions and Debris annually.

3.2 Quantified Maintenance Services

The Contractor must place Rip-rap of (class) 50 kg or greater, sufficient to withstand a water flow representing a One Hundred Year Flood.

3.2.1 Performance Time Frames

The Contractor must:

- a) place Rip-rap required for locations identified in Section 3.1.1.a) within 2 hours from the time the deficiency was detected by or reported to the Contractor, and after determining that it is safe to proceed with the work or, if the Contractor's assessment indicates that the work cannot safely commence within 2 hours, the Contractor must notify the Province and must commence work when the Province notifies the Contractor it safe to do so;
- b) complete maintenance repairs to shores, banks and watercourses within 5 days of the elimination of the obstruction;

- c) plan to perform all identified Rip-rap placement within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year, the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

The Contractor warrants all Shore, Bank and Watercourse Maintenance Services against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 2-280

ENGINEERED WETLAND AND WATER QUALITY POND MAINTENANCE

1. OBJECTIVE

To maintain engineered wetlands and water quality ponds to allow settling of suspended sediments from road runoff, and filtering of road runoff prior to discharge downstream.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must clean and repair, by hand, drainage appliances, including cleaning and removing Debris from inlets and outlets.

2.2 Quantified Maintenance Services

The Contractor must replace existing or install new drainage appliances when required; clean and remove, by machine, Debris from inlets and outlets.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) notify the Province of build up of sedimentation and damage to drainage appliances;
- b) remove Debris from pond inlets and outlets;
- c) remove and dispose of accumulated sediments from the pond settling areas, as directed by the Province;
- d) repair any worn, bent, broken, or damaged appliances.

3.1.1 Performance Time Frames

The Contractor must:

- a) immediately, from the time the deficiency was detected by or reported to the Contractor, notify the Province of build up of sedimentation and damage to drainage appliances; and
- b) remove sedimentation, by hand, as directed by the Province; and
- c) repair, by hand, any worn, bent, broken or damaged appliances, as directed by the Province

3.2 Quantified Maintenance Services

The Contractor must:

- a) replace any missing appliances and/or any worn, bent, broken, or damaged appliances, or install new drainage appliances, in accordance with the Maintenance Specification for *Drainage Appliance Maintenance* (subject to section 3.2.1 d) , with credit for such work under the Maintenance Specification for *Drainage Appliance Maintenance* if repair is not practicable;
- b) place Rip-rap where necessary to prevent erosion, in accordance with the Maintenance Specification for *Shore, Bank and Watercourse Maintenance* (subject to 3.2.1 d), with credit for such work under the Maintenance Specification for *Shore, Bank and Watercourse Maintenance*; and
- c) clean and remove Debris from inlets and outlets.

3.2.1 Performance Time Frames

The Contractor must:

- a) replace and install new drainage appliances as directed by the Province;
- b) place Rip-rap as directed by the Province;
- c) clean and remove Debris from inlets and outlets as directed by the Province; and

- d) comply with the Performance Time Frames in this Maintenance Specification and not the respective Performance Time Frames outlined in the Maintenance Specification for *Drainage Appliance Maintenance* and *Shore, Bank and Watercourse Maintenance*.

3.3 Materials

Not applicable to this Maintenance Specification.

4. WARRANTY

Not applicable to this Maintenance Specification.

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:

Winter Highway Classification			
A	B	C	D
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:

Winter Highway Classification			
A	B	C	D
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:

Winter Highway Classification			
A	B	C	D
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:

	Winter Highway Classification		
	Class A & B	all Class C and Class D paved only	all Class D gravel Highways
(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:

Highway Classification			
A & B	C	D	E
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.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 4-350

ROADSIDE VEGETATION CONTROL

1. OBJECTIVE

To ensure visibility for Highway Users; to control noxious weeds; to facilitate effective drainage; and to reduce possible fire hazards.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

All services for this Maintenance Specification are Quantified.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.1.1 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor must:

- a) remove vegetation beyond the Shoulder edge that:
 - i) causes Sight Distance obstructions on curves or at intersections of Highways and at accesses;
 - ii) causes Sight Distance obstructions at Railway Crossings or Railway Crossing Approaches;

- iii) obscures the visibility of Signs, delineators, animal reflectors, other Roadside features or for Highway Users;
 - iv) constitutes noxious weeds; and
 - v) impedes drainage.
- b) perform Shoulder mowing along Class 1-5 Highways to a width of 1.8 metres beyond the Shoulder edge;
 - c) perform area mowing at locations and to a width as determined by the District Manager, Transportation;
 - d) perform Rest Area mowing within 1.8 m of pathways, picnic table areas, buildings and other Rest Area facilities, Highways and parking areas;

Note: All mowing (Shoulder, area and Rest Area mowing, must be reported in Shoulder swath kilometres (ssk); 1 ssk is equal to one swath 1.8 m wide by 1,000 m long; and, 1 hectare equals 5.5 ssk.

- e) mow to the lowest possible height given the terrain, using an industry standard mower.
- f) remove Danger Trees that are unsafe or have the potential to become unsafe to Highway Users and/or adjacent lands;

Note: The Contractor is not responsible for remedying large volumes of Danger Trees at any particular structurally damaged stand adjacent to the Highway;

- g) remove overhanging limbs within any Right-of-way that are at an elevation of between 0 and 8 meters above the Travelled Lanes as follows:
 - i) within 3 meters of the Shoulder edge on Class 1 to 3 Highways; and
 - ii) within 2 meters of the Shoulder edge on Class 4 to 7 Highways;

- h) remove trees and brush when maximum height above the Travelled Lane is reached and is as specified in the table below:

Summer Highway Classification	VEGETATION ZONE Distance from the Shoulder edge where vegetation control is required	Vegetation control is required when trees and brush exceed this height within vegetation zone
Medians and interchanges	1.5 to 15 metres	2 metres
Class 1 - 6 Highways	0 to 1.8 metres	.5 metres
Class 1-3 Highways	1.8-7 metres	3 metres
Class 4-6 Highways	1.8 to 5 metres	4 metres
Class 7 Highways	0-1.8 metres	4 metres

- i) dispose of vegetation control cuttings that represent a hazard, obstruct drainage or create a nuisance;
- j) remove vegetation as necessary to reduce winter icing problems;
- k) remove vegetation within a 5 meter perimeter of Bridges and other structures to facilitate inspections and maintenance;
- l) not remove vegetation, except for Danger Trees, where ground elevation where the vegetation is located is more than 3 metres above or below the Travelled Lane elevation;
- m) on public Highways under section 4 of the Highway Act, brush to the fence line where fences have been erected by the landowner through private property or to the brush line from previous brushing;

Note: Where fences or previous brushing lines do not exist, the Contractor must obtain permission of the landowners to proceed with the maintenance work. Where permission is denied, the Contractor must advise the Province.

Only where section 4 Highways pass through properties where the status of the Highway is the subject of litigation, where the Province determines that the status is questionable, or where it runs through Federal lands, is the Right-of-way considered to be limited to the working surface. In disputed cases, the Contractor must take adequate steps to ensure public safety in regard to travel on the Highway before leaving the location.

- n) remove Danger Trees and vegetation on private land that restrict Sight Distance and are unsafe or have the potential to become unsafe for Highway Users, after securing permission from the landowner, or if unable to secure permission in a timely manner, notify the Province immediately and perform vegetation control as directed by the Province;
- o) remove vegetation that obstructs drainage in accordance with the Maintenance Specification for *Ditch and Watercourse Maintenance*, with credit for the work under the Maintenance Specification for *Ditch and Watercourse Maintenance*, only if it is completed with earth moving equipment; and
- p) control vegetation from the Shoulder edge to the edge of the pavement in accordance with the Maintenance Specification for *Highway Shoulder Maintenance*.

Note: The Contractor will not be required to:

- 1. control vegetation beyond the ditch Backslope in provincial parks unless such vegetation is unsafe or has potential to become unsafe for Highway Users or as otherwise directed by the Province.
- 2. remove standing timber except where it is unsafe or has the potential to become unsafe for Highway Users.

3.2.1 Performance Time Frames

The Contractor must:

- a) remove vegetation as described in 3.2.a) i) ii), iii) and v) immediately, from the time the deficiency was detected by or reported to the Contractor;
- b) cut noxious weeds prior to the development of seed;

- c) perform Shoulder mowing, area mowing and Rest Area mowing when the grass reaches 25 cm; up to a maximum of 2 cuts per year;
- d) remove Danger Trees within 7 days from the time the deficiency was detected by or reported to the Contractor;
- e) identify and flag any Danger Tree site immediately from the time the deficiency was detected by or reported to the Contractor;
- f) plan to perform all identified vegetation control within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year, the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 4-370

LITTER COLLECTION AND GRAFFITI REMOVAL

1. OBJECTIVE

To keep Highways clean and tidy.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must:

- a) remove litter and graffiti from Highways that is visible from the Travelled Lanes;
- b) locate and empty litter receptacles at Rest Areas, Pull-outs and at Weigh Scale Areas;
- c) remove graffiti from the Right-of-way to return the marked surface to the original condition if possible. If the graffiti material cannot be removed, apply covering paint of an appropriate colour in a manner to minimize the aesthetic impacts of the repair and in accordance with the paint manufacturer's specifications; and
- d) report vehicles or equipment abandoned on the Right-of-way to the RCMP or the local police.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

3.1.1 Performance Time Frames

The Contractor must:

- a) collect litter in compliance with the minimum litter collection frequencies specified in the following table:

Summer Highway Classification	Minimum Frequency of Debris and Litter Collection
Highways with traffic volumes over 50,000 vehicles per day	every 7 d
Highway 1 and other Lower Mainland multi-lane Highways, 4-lane Highways on Vancouver Island and other Urban Freeways	every 14 d
other Urban Highways	every 21 d
other Class 1 Highways	every 30 d
other Class 2 Highways and designated routes to garbage disposal sites	every 60 d
other Class 3 Highways	every 90 d
all other Highways	every 6 m

Legend

d – days

m – months

- b) remove or cover graffiti on natural features and Highway inventory within the times listed in the following table:

Summer Highway Classification				
1&2	3	4	5	6&7
3 d	6 d	9 d	15 d	30 d

Legend

d - days

- c) empty litter receptacles every three days or when they become full, whichever occurs first; and
- d) pick up and remove all litter in and around Rest Areas, Pull-outs and at Weigh Scale Areas at the same time as litter receptacles are emptied.

3.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3.1.2 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Materials

Not applicable to this Maintenance Specification.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 4-380

REST AREA AND ROADSIDE FACILITY MAINTENANCE

1. OBJECTIVE

To provide safe, clean and sanitary toilet and picnic facilities for Highway Users.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain all structures, fixtures and appliances at Rest Area sites and Roadside facilities.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) clean and disinfect all plumbing fixtures and mirrors;
- b) clean and disinfect all sanitary and waste receptacles, floors, wall bases and dispensers of supplies;
- c) maintain and stock all dispensers with supplies;
- d) ensure that floor drains and traps are operational;
- e) ensure buildings and structures are free of all cobwebs;
- f) clean, refinish or re-paint all building surfaces damaged by graffiti;
- g) remove snow and ice from the outer entrance doors, floor areas and walkways;

- h) install interior winter vent covers before first snowfall (or before October 15 of each year at the latest) and remove the covers April 1 of each year at the latest;
- i) clean, varnish and seal as required picnic table tops and seats, wood seats and base ends;
- j) remove all Debris from areas surrounding the building and clean concrete, asphalt and gravel walkways;
- k) clean light fixtures and ensure they are functional and properly assembled;
- l) ensure that septic and holding tanks, septic fields and sewage lagoons are operating properly at all times;
- m) maintain composting toilets in accordance with the operating manual for that particular composting toilet;
- n) maintain, repair and/or replace as required all structures, heating systems, water systems, walkways, fixtures and appliances;
- o) provide vegetation control in accordance with the Maintenance Specification for *Roadside Vegetation Control*, with credit for such work under the Maintenance Specification for *Roadside Vegetation Control*;
- p) report acts of vandalism and misuse of a Rest Area or Roadside facility to the police and the Province;
- q) remove or cover Rest Area and Roadside facility advance and directional signing and board over or lock entrance doors for those facilities that are closed during the winter in accordance with the requirements for each particular facility;
- r) maintain Rest Area access roads and parking lots in accordance with all specifications for roads of one Classification lower than the adjacent Highway; and

Note: If it is estimated by the Contractor and confirmed by the Province, that at any particular time for a Rest Area or Roadside facility, the costs to repair or replace a structure, heating system, water system, sewer system, fixture or appliance, exceeds \$10,000, refer to Section G of the Introduction to these Maintenance Specifications.

3.1.1 Performance Time Frames

The Contractor must:

- a) repair any failure of heating, water supply or sewer system at a Rest Area or Roadside facilities within two hours from the time the deficiency was detected by or reported to the Contractor;
- b) repair any structural components such as broken doors, broken or missing roof vents or roof leaks within 2 hours from the time the deficiency was detected by or reported to the Contractor; and, immediately respond to any major repairs, as determined by the Contractor and approved in writing by the Province, completing those agreed to major repairs within 14 days of receiving approval;
- c) perform maintenance on the facilities within the minimum frequencies indicated on the following table:

Facilities Maintenance		Class A Rest Areas	
		Oct. 15 to March 31 each year (inclusive)	April 1 to Oct. 14 of each year (inclusive)
i)	clean plumbing fixtures including exterior surfaces of structures	daily	daily
ii)	check or inspect structures for damaged, missing or faulty components and complete repairs or replacement	daily	daily
iii)	ensure that all heating apparatuses are in working order and that thermostats are set properly	daily	daily or more often if required
iv)	clean and restock toiletry receptacles	as required	as required
v)	clean and disinfect floors including wall bases, drains and traps	3 times per week	daily
vi)	clean interior surfaces of partitions, seats, walls including the enamel surfaces, piping and toilet seat hinges	3 times per week	3 times per week

Facilities Maintenance	Class A Rest Areas	
	Oct. 15 to March 31 each year (inclusive)	April 1 to Oct. 14 of each year (inclusive)
vii) clear all cobwebs from inside and outside of buildings	daily	daily or more often if required
viii) remove marks and graffiti from walls	daily	daily or more often if required
ix) remove litter in the area surrounding the building and sweep walkways and remove weeds	daily	daily or more often if required
x) empty and recharge chemical toilets, pump out pit toilets, and maintain a clean, sanitary and odour-free facility	daily	daily or more often if required
xi) remove snow from the outer entrance doors; remove drifting or tracked-in snow in the vestibule areas and clear snow and ice off abutting concrete pads under the drip line of the building roofs; apply salt or other chemicals to ensure paths are kept in a safe condition free from ice and snow	daily	daily or more often if required
xii) clean and/or wash interior walls, ceilings and light fixtures to maintain sanitary conditions	weekly	weekly or more often if required
xiii) charge pit toilets with a commercial enzyme	monthly	weekly
xiv) monitor sewage level of disposal systems and ensure proper functioning	bi-monthly	monthly
xv) clean concrete terrazzo picnic table tops	bi-monthly	weekly
xvi) prepare concrete terrazzo table tops and apply a minimum of one coat of terrazzo sealer; sand down to base wood and varnish picnic table seats	yearly	yearly

Note: For Class B and C Rest Areas, the Contractor must perform maintenance described in Section 3.1.1. i), iii), iv), xi) and xii) twice weekly during October 15 through March 31 of each year, three times per week during April 1 through October 14 of each year, and all other maintenance in accordance with the frequencies specified for Class A Rest Areas. The Contractor must maintain appliances located at other Roadside facilities at the same frequencies as indicated for a Class C Rest Area. Some Rest Areas, as determined by the Province, may be closed over the winter months or during other specified periods in which case these maintenance requirements are suspended during the closure.

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

Refer to Section B of the Introduction of these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 4-400

ROADSIDE FENCE MAINTENANCE

1. OBJECTIVE

To prevent game, Wildlife, Livestock and pedestrians from entering onto the Highway, restore the functionality of Specialty Fences.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must:

- a) repair fences along Schedule 1 and Schedule 2 Highways; and
- b) provide initial traffic control until police authorities or Livestock owners arrive at the scene.

2.2 Quantified Maintenance Services

The Contractor must perform permanent repairs on fences.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) make temporary repairs to fences along Schedule 1 and Schedule 2 Highways to restore the functionality of any section of fence that has been damaged as a result of the following:
 - i) motor vehicle accidents;
 - ii) acts of vandalism;
 - iii) fallen trees from the Right-of-way;
 - iv) slides, fire, flood; or
 - v) other natural occurrences; and

- b) provide initial traffic control in accordance with the Maintenance Specification for *Highway Traffic Control* until the police or livestock owners are on site to remove the livestock.

3.1.1 Performance Time Frames

The Contractor must:

- a) start temporary repairs within 1 hour, from the time the deficiency was detected by or reported to the Contractor, to fences along Schedule 1 and Schedule 2 Highways when the damage is the result of one of the conditions described in 3.1 a); and where livestock is loose, or has the potential to get loose;
- b) start temporary repairs within 24 hours, from the time the deficiency was detected by or reported to the Contractor, to fences along Schedule 1 and Schedule 2 Highways when the damage is the result of one of the conditions described in 3.1 a); and where no livestock is loose, or has the potential to get loose.

3.2 Quantified Maintenance Services

The Contractor must:

- a) make permanent repairs to or construct new Specialty Fences;
- b) make permanent repairs to fences along Schedule 1 and Schedule 2 Highways when the damage is the result of one of the conditions described in section 3.1 a);
- c) repair all fences consistent with the existing type of fence or as approved in writing by the Province.

3.2.1 Performance Time Frames

The Contractor must:

- a) commence temporary repairs to Specialty Fences, when the repair is of a safety-related nature, within 1 hour from the time the deficiency was detected by or reported to the Contractor;
- b) complete permanent repairs to Specialty Fences within 7 days from the time the deficiency was detected by or reported to the Contractor;

- c) complete permanent repairs to fences along Schedule 1 and Schedule 2 Highways within 7 days from the time the deficiency was detected by or reported to the Contractor; and
- d) plan to perform all identified fence repairs and installations within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year, the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure;
- e) for permanent repairs to, or construction of Specialty Fences, the Contractor and the Province will negotiate a price for the work to the limit of the Quantified Provisional Sum identified for such work within the Contract Year and the Contractor must complete such work in accordance with this Maintenance Specification.

3.3 Materials

Refer to Section B of the Introduction of these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 5-440

SIGN SYSTEM MAINTENANCE

1. OBJECTIVE

To regulate and facilitate the safe and orderly movement of traffic.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must:

- a) clean and repair existing Sign Systems and their components;
- b) reset Sign Systems that are accidentally knocked or blown down;
- c) relocate Sign Systems and Pickets that need to be removed and re-installed due to seasonal requirements or due to changing needs or conditions; and
- d) replace reflectors and Pickets.

2.2 Quantified Maintenance Services

The Contractor must:

- a) replace or install new Sign Face Overlays, Signs and Sign Systems;
and
- b) relocate, due to policy changes, Signs and Sign Systems as required by the Province.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) keep all Sign Systems and Pickets clean, legible, adequately reflectorized, erect and correctly located in accordance with the Sign Manuals and the Province's Policy for Highway Signs as outlined in Appendix "A" of this Maintenance Specification, or as otherwise specified by the Province;
- b) relocate Sign Systems at Highway locations that are required to be removed and re-installed due to seasonal requirements or due to changing needs or conditions, at those Highway locations determined by the Province;
- c) replace reflectors with the same type, size and quality as existing and in accordance with the sign manuals listed in Section J of the Introduction to these Maintenance Specifications;
- d) replace Pickets;
- e) obtain prior approval from the Province for all re-ordering and design of guide signs and special information signs; and
- f) remove, store and be responsible for any illegal or unauthorized Signs or Sign Systems on the Highways, as directed by the Province.

3.1.1 Performance Time Frames

- a) The following table establishes the maximum time from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the cleaning, resetting, repair, and/or relocation of Sign Systems and Pickets:

Type of Sign marking (in accordance with the Sign Manuals)	Summer Highway Classification		
	1&2	3&4	5,6&7
(i) regulatory and warning	24 h	24 h	24 h
(ii) school and pedestrian	24 h	2 d	3 d
(iii) delineators and Pickets	24 h	2 d	3 d
(iv) parking and stopping	24 h	2 d	3 d
(vii) direction (guide)	2 d	3 d	7 d

Type of Sign marking (in accordance with the Sign Manuals)	Summer Highway Classification		
	1&2	3&4	5,6&7
(viii) information	2 d	3 d	7 d
(ix) service and attraction	2 d	3 d	7 d
(x) all other Signs	7 d	7 d	7 d

Legend

d – days

The Contractor must:

- b) notwithstanding 3.1.1 a), make temporary repairs to any regulatory or warning Sign that is determined to be a Damaged Sign as described in Appendix A of this Maintenance Specification or if any stop or yield Sign is missing; and initiate installation of temporary signage or provide traffic control in accordance with the Maintenance Specification for *Highway Traffic Control* immediately, from the time the deficiency was detected by or reported to the Contractor;
- c) touch up or re-paint all Sign and delineator posts when the surface is discoloured or damaged and re-paint all wood posts a minimum of once every three years;
- d) relocate Sign Systems and Pickets required to be removed and reinstalled due to seasonal requirements or changing needs or conditions within 7 days from receiving direction from the Province;
- e) replace surface reflectors within 10 days from the time the deficiency was detected by or reported to the Contractor, where more than 25 percent of the reflectors along any continuous 500-metre section of Highway are missing, damaged or have lost their reflectivity;
- f) replace surface reflectors within 30 days from the time the deficiency was detected by or reported to the Contractor, where less than 25 percent of the reflectors along any continuous 500-metre section of Highway are missing, damaged or have lost their reflectivity; and

- g) replace Guardrail and animal reflectors within 30 days from the time the deficiency was detected by or reported to the Contractor, where more than 25 percent of the reflectors along any continuous 500-metre section of Highway are missing, damaged or have lost their reflectivity.

3.2 Quantified Maintenance Services

The Contractor must:

- a) replace or install new Sign Face Overlays, Signs and Sign Systems; and
- b) relocate Signs and Sign Systems as required by the Province because of policy changes.

Note: The Contractor will not mount Signs on poles or structures without the prior approval of the Province and/or the owner of the poles or structures.

3.2.1 Performance Time Frames

The Contractor must:

- a) replace or install new regulatory, warning or school and pedestrian Sign Face Overlays, Signs and/or Sign Systems within 24 hours from receiving direction from the Province;
- b) order, replace or install new guide or information Sign Face Overlays, Signs and/or Sign Systems as follows:
 - i) order within 24 hours of receiving direction from the Province; and
 - ii) install within 24 hours of delivery.
- c) install delineators and all other Sign Face Overlays, Signs and/or Sign Systems within 7 days of receiving direction from the Province; and
- d) plan to perform all required Sign Face Overlays, Signs and Sign System deficiencies within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities the Contractor must ensure repairs are identified and carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

The Contractor must ensure that:

- a) Sign Face Overlays, Signs and Sign Systems must be as specified in the Specifications for Standard Highway Sign Materials, Fabrication and Supply; and in the Sign Pattern Manual;
- b) metal posts and battens are made of perforated, Galvanized steel square tubing or of other material as approved in writing by the Province;
- c) all wooden posts and battens are pressure-treated wood S4S, with dimensions, colour and shape as specified in the Standard Specifications for Highway Construction;
- d) metal or concrete posts for delineators are as specified in the Sign Manuals and that plastic or fiberglass delineator posts are in accordance with the Standard Specifications for Highway Construction;
- e) oil-base, solid colour stain or oil-base exterior paint, compatible primer paint and standard paint colours are as specified in the Sign Manuals, with all materials meeting the CGSB specifications as to quality, coverage and colour in accordance with the Standard Specifications for Highway Construction;
- f) all hardware is of non-corrosive material to avoid discolouration of Sign and delineator faces;
- g) delineator reflectors and reflective sheeting are in accordance with the Sign Manuals;
- h) concrete and other materials used for production and fabrication of Sign bases are in accordance with the Sign Manuals, Standard Specifications for Highway Construction or as otherwise approved in writing by the Province;
- i) Pickets, animal reflectors and other materials are as approved in writing by the Province; and
- j) Guardrail reflectors are as specified in the Standard Specifications for Highway Construction.

4. WARRANTY

Not applicable to this Maintenance Specification.

BC MINISTRY OF TRANSPORTATION

Maintenance Specification

SIGN SYSTEM MAINTENANCE

APPENDIX "A"

Policy for Highway Signs

Poorly maintained Signs and other Sign Systems reduce Highway safety and spoil the appearance of an otherwise well maintained Highway. To be respected by Highway Users and to be useful and effective, Sign Systems must be correctly used and correctly placed.

Effective Signing requires:

- a) selection of the correct Sign System for a particular situation;
- b) correct location of the Sign System; and
- c) ongoing maintenance to ensure that the Sign and its post(s) are in good condition.

In order to meet the requirements of this policy, the Contractor must engage in practices that ensure that all Signs and other Sign Systems are correctly placed, clearly display the necessary messages to ensure the safe and orderly movement of traffic, and meet other safety, aesthetic and economic benefits. This requires that the Contractor carry out its obligations in accordance with this Maintenance Specification in a manner that minimizes the overall deterioration of Signs and other Sign Systems.

The following descriptions of "Sign Deterioration" and "damaged Sign" must be referred to in this Maintenance Specification:

"Sign Deterioration"

Each Sign face will be kept visible and legible under both day and night time conditions. It should be noted that all Signs will gradually deteriorate to a point where the Signs must be Refurbished or replaced. The retro-reflective sheeting of Signs deteriorates from the effects of sunlight, weather, airborne particles, and air pollution. Dirt from road spray, snow and ice removal from the roadway, and air pollution may collect on the Sign sheeting, and, if unchecked, will severely affect the night time visibility of the Sign.

A Sign face is considered to have lost its retro-reflectivity for night time display when the area of limited retro-reflectivity or blotchy reflectiveness exceeds 25% of the Sign face area. A Sign face is also considered to have lost its retro-reflectivity when the

reduced retro-reflectivity, as determined by the Province, overrides the ability of the Sign text, colour, or legend to be effectively presented to the travelling public or other intended audience.

"Damaged Sign"

A Sign is considered to be a damaged Sign where:

- a) the Sign is not flat (planar) and properly oriented to the travelling public or other intended audience;
- b) either 10 square cm or 1% (whichever is greater) of the Sign face area is damaged, dented, vandalized or otherwise not as new; or
- c) in the opinion of the Province, the intended message to the travelling public or other intended audience is unclear or confusing.

Managing Sign and Other Sign Systems Maintenance

The Province does not currently have a comprehensive or consolidated "Sign Maintenance Manual". It is therefore expected that the Contractor will develop an integrated process to accomplish an effective Sign maintenance program.

Contractors will base their program on the contents of the following publication or other sources as approved by the Province:

Maintenance Management of Street and Highway Signs
NCHRP Synthesis 157

ISSN 0547-5570
ISBN 0-309-04910-5

available from:

Transportation Research Board
National Research Council
2101 Constitution Avenue, N.W.
Washington, DC 20418

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 5-450

TEMPORARY LINE MARKING AND ERADICATION

1. OBJECTIVE

To facilitate the safe and orderly movement of traffic.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must:

- a) place temporary line markings as required to delineate traffic lanes between the centreline, lane lines and turning lanes at locations where the absence of or deficiencies in pavement markings are unsafe or have the potential to become unsafe for Highway Users; and
- b) eradicate line markings as required.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) place temporary line marking tape on all existing and new pavement surfaces required as a consequence of the Contractor's provision of the Maintenance Services;
- b) ensure that all temporary line markings are well-defined, clear, distinct and in accordance with the Manual of Standard Traffic Signs and Pavement Markings;
- c) ensure that line markings bond to the surface will last for up to 1 month or until the permanent markings are applied;

- d) remove or completely eradicate line markings which are superfluous or obsolete or as directed by the Province;
- e) ensure that the surface is not damaged as a result of any grinding or other eradication technique used to remove temporary line markings; and
- f) remove paint or other pavement marking materials and dispose of the residue in a manner acceptable to regulatory agencies.

3.1.1 Performance Time Frames

The Contractor must:

- a) when temporary line markings are required as a consequence of the Contractor's provision of Maintenance Services, place temporary line markings and eradicate temporary and permanent line markings within 3 hours of completing such Maintenance Services; and
- b) gather and remove from the work site on a daily basis all refuse resulting from activities provided within this Maintenance Specification.

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

Refer to the Manual of Standard Traffic Signs & Pavement Markings.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 5-470

HIGHWAY TRAFFIC CONTROL

1. OBJECTIVE

To keep Highways safe; and to minimize delays for, and advise Highway Users of the duration and cause of delays.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must:

- a) perform traffic control in conjunction with the delivery of the Maintenance Services;
- b) perform traffic control for road closures; and
- c) perform initial traffic control in response to all situations on the Highway that are unsafe or have the potential to become unsafe.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) initiate traffic control or request a Highway closure, as appropriate, upon detection or notification of a hazard or potential hazard;
- b) perform traffic control for complete closures of Highways;

- c) provide traffic control as required during the performance of the Maintenance Services; utilize the Traffic Control Manual for Work on Roadways as the primary reference for the placement and use of traffic control devices and for traffic control procedures, and use in conjunction with other Sign manuals;
- d) notwithstanding the Traffic Control Manual for Work on Roadways, perform the following in connection with traffic control for working personnel and equipment:
 - i) whenever lane closures reduce a two-way road to a single lane, a traffic control person must be used to control traffic whenever traffic volume exceeds 100 vehicles per hour, counted in both directions;
 - ii) in connection with continuously slow-moving operations, use a Shadow Vehicle and associated traffic control devices on all Class 1-3 Highways, except where the use of a Shadow Vehicle would be hazardous because of poor alignment, gradient or other Sight Distance obstruction, then the Contractor must use traffic control persons and/or other traffic control procedures; equipment used for snow removal and/or abrasive or chemical applications is excluded from this requirement;
- e) where traffic flow is restricted due to the operations of the Contractor and the delay exceeds 30 minutes, adjust the operations or terminate work until the traffic volume eases;
- f) obtain the prior written approval of the Province to use portable lane control signals. The Contractor must monitor traffic flows and adjust the timing to ensure optimum traffic flow and safety; and
- g) obtain the prior written approval of the Province temporary traffic control signals. The design and timing of temporary signals must also receive prior written approval of the Province and must comply with the relevant sections of the Motor Vehicle Act and of the Regulations pursuant to the Motor Vehicle Act.

3.1.1 Performance Time Frames

The Contractor must perform traffic control immediately, from the time the deficiency was detected by or reported to the Contractor.

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.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-500

BRIDGE DECK MAINTENANCE

1. OBJECTIVE

To provide safe, uniform, smooth, stable and durable surfaces on Bridge Decks and to maximize the functional life of the structure.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must complete temporary repairs to Bridge Deck Systems.

2.2 Quantified Maintenance Services

The Contractor must perform permanent repairs to deteriorated concrete, asphalt and timber Bridge Deck systems, including but not limited to concrete restoration, concrete crack sealing, timber plank replacement or replacement of complete or major portions of timber Decks with or without cross-ties.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) complete temporary repairs to Bridge Deck Systems in accordance with Section B of the Introduction of these Maintenance Specifications and the manufacturer's specifications; and
- b) restore Bridge Deck systems to a safe, durable, even and free-draining condition and that is securely fastened or bonded to the support structure.

3.1.1 Performance Time Frames

The following table establishes the maximum time from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

Deck Deficiency	Summer Highway Classification			
	1&2	3&4	5,6 &7	8
a) Pot-holes in concrete and asphalt Decks - Travelled Lane - remainder of Deck	4 h 2 d	6 h 3 d	24 h 5 d	16 d 30 d
b) loose, broken or rotted timber Deck planks - Travelled Lane - remainder of Deck	4 h 2 d	6 h 3 d	24 h 5 d	16 d 30 d
c) loose sections, broken welds on steel Decks - Travelled Lane - remainder of Deck	4 h 2 d	6 h 3 d	24 h 5 d	16 d 30 d
d) welding, repair, and tightening of steel Deck systems	7 d	15 d	2 m	6 m

Legend

h - hours

d – days

m – months

3.2 Quantified Maintenance Services

The Contractor must:

- a) complete permanent repairs to the Bridge Deck systems in accordance with Section B of the Introduction to these Maintenance Specifications and the manufacturer's specifications; and

- b) restore the Bridge Deck Systems to the following specifications:
 - i) smooth and safe Wearing Surface;
 - ii) repaired area is not to be restricted to visibly deteriorated area;
 - iii) concrete Deck repairs are to be sound, durable and well bonded to the prepared surface;
 - iv) concrete patch finish is to be tined or broomed;
 - v) concrete Bridge Deck cracks sealed to a minimum depth of 6 mm;
 - vi) patch or crack repair is to match existing Deck profile;
 - vii) timber Deck repair is to be structurally sound, tight-fitting and securely fastened; and
 - viii) timber planks replaced when wear or deterioration exceeds 25% of cross-section.
- c) repair or replace asphalt Wearing Surfaces in accordance with the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*, with credit for such work under the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*. Where the intent of the overlay is to provide a waterproofing layer, a pre-fabricated membrane must be applied first.

3.2.1 Performance Time Frames

The Contractor must:

- a) complete the repair of the deficiencies within 6 months from the time the deficiency was detected by or reported to the Contractor; and

- b) apply linseed oil/mineral spirit in accordance with the following frequencies:
 - i) first re-application – one-year-old concrete surface treatment;
 - ii) second re-application – two-year-old concrete surface treatment;
 - iii) third re-application – four-year-old concrete surface treatment; and
 - iv) fourth re-application – six-year-old concrete surface treatment;
- c) The Contractor must plan to perform all identified Bridge Deck repairs within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

The Contractor must:

- a) refer to Section B of the Introduction to these Maintenance Specifications;
- b) use timber Deck materials in accordance with the following:
 - i) cross-ties must be number 1 or better grade, S2S Douglas Fir, cross-ties must be a minimum of 150 mm X 150 mm (6 inch by 6 inch) by the full width the Bridge Deck. Size tolerance is plus or minus 3 mm and maximum Wane allowed must be 10 mm on any surface and cross-ties must be preservative-treated;
 - ii) laminated Decking material must be preservative-treated;
 - iii) re-Decking planks must be of number 1 grade and Wane free, SIS2E, Heart-Side surfaced, 100 mm X 250 mm (4 inch by 10 inch) Douglas Fir, in minimum 4.9 metre (16 foot) lengths laid Heart-Side down;

- iv) all fasteners must be hot-dip Galvanized;
- v) Bridge railing and Bridge post material replaced during timber re-Decking must be in accordance with the Maintenance Specification for *Bridge Railing Maintenance*, with no credit for such work under the Maintenance Specification for *Bridge Railing Maintenance*;
- vi) Ekki Wood, where specified for use by the Province, is normally ordered by actual dimensions and must be in accordance with the following requirements:
 - 1) minimum modulus of rupture in static bending must be 150 MPa;
 - 2) minimum crushing strength will be 70 MPa;
 - 3) timbers must be free of Heartwood, Sapwood, and Wane except members larger than 350 mm by 350 mm which may contain Boxed Heartwood;
 - 4) sound, tight and well-spaced knots not larger than 50 mm are permitted at a maximum of one knot per linear metre of board length;
 - 5) maximum Crook must be 25 mm. Surface checks and Splits must have a maximum length of 150 mm. Slope of Grain will be 1:10 maximum;
 - (6) size tolerance must be plus or minus 3 mm; and
 - (7) Galvanized lag bolts must be used on Ekki Wood Decking;

4. WARRANTY

The Contractor warrants all Bridge Deck maintenance against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-510

BRIDGE AND STRUCTURE CLEANING

1. OBJECTIVE

To preserve the Bridges and structures; and to remove dirt, Debris, and deleterious materials that are unsafe or have the potential to become unsafe for Highway Users.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must clean Bridges, structures, and associated components.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) clean all surfaces (horizontal and vertical) on Bridges, structures and associated components;
- b) clean railings and Truss members to a minimum height of 3 metres above the Deck surface;
- c) ensure that cleaning of Underpasses, Overpasses, Flyovers and Overheads is performed without damage to property or cause injury to Highway Users; and

Note: The Contractor must not perform Bridge and structure cleaning when temperatures are 0 degrees celsius or less, or when such temperatures are anticipated within 24 hours.

3.1.1 Performance Time Frames

The Contractor must:

- a) clean all Bridges, structures and associated components in the spring of each year when reasonable assessment indicates no further Winter Abrasives or chemicals will be applied and within the earliest allowable environmental window, as specified by the appropriate environmental agencies, or by June 30th of each year, whichever comes first;
- b) comply with the following table which establishes the maximum time, from the time dirt, Debris, and deleterious materials that are unsafe or have the potential to become unsafe for Highway Users are detected by or reported to the Contractor, within which the Contractor must complete the cleaning to the following Bridge decks and sidewalks:

Deck and Sidewalk Locations	Time to complete
(i) Fraser River crossings (Oak Street to Port Mann) Lions Gate Bridge Second Narrows Bridge	30 d
(ii) Urban Freeways except as described in (i)	90 d
(iii) Urban Highways except as described in (i) and (ii)	6 m
(iv) all other Highways	1 y

Legend

d -days

m – months

y - years

- c) immediately clean structures when conditions are of an urgent nature such as, but not limited to, storm events, Debris accumulation and/or accidents; and
- d) clean and remove foreign objects from any surfaces where free drainage of the surface is impaired or cause moisture retention on surfaces, within 14 days from the time the deficiency was detected by or reported to the Contractor.

3.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3.3 Materials

Not applicable to this Maintenance Specification.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-520

BRIDGE DRAIN AND FLUME MAINTENANCE

1. OBJECTIVE

To provide effective drainage that carries water away as quickly as possible from Bridge Decks, Substructures and Foundations.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must repair and replace, Bridge Drains and Flumes and related components that have deteriorated to a condition that is unsafe or has the potential to become unsafe for Highway Users; and to prevent further deterioration of the Bridge structure.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) perform Bridge Drain and Flume maintenance in accordance with Section B1 of the Introduction;
- b) remove trapped or Ponding water to prevent damage to Bridge Decks, Bearings and Substructures;
- c) clear catchment areas that have become clogged;
- d) maintain Flumes to carry water from drain pipes down Fill Slopes and away from Bridge Abutment Fills and Wing Walls;
- e) ensure that steel grills are securely anchored; and
- f) clear, repair or replace all grills, Drain pipes, Flumes and funnels that are clogged, rusted, damaged, separated or missing.

3.1.1 Performance Time Frames

The Contractor must:

- a) complete cleaning and unplugging of any clogged steel grill or Drain pipe that causes Ponding on Bridge Decks within a Maximum Response Time of one hour from the time the deficiency was detected by or reported to the Contractor;
- b) complete unplugging of any grills, Drain pipes or Flumes that are plugged, but do not cause Ponding on Bridge Decks, within 14 days from the time the deficiency was detected by or reported to the Contractor;
- c) inspect Drains and Flumes monthly, or more frequently if required, to identify drainage problems in areas that historically have frequently plugged drains; and
- d) complete repair or replacement of damaged or missing grills, Drain pipes or Flumes within 14 days from the time the deficiency was detected by or reported to the Contractor, or commence immediate repairs or replacements when the deficiency is detected by or reported to the Contractor if they are unsafe or have the potential to become 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

Refer to Section B1 of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-530

BRIDGE JOINT MAINTENANCE

1. OBJECTIVE

To provide a safe, smooth and stable condition for Highway Users and to maximize the functional life of the Bridge.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain, repair or re-seal Bridge Joints and Bridge Joint Armours that are unsafe or have the potential to become unsafe.

2.2 Quantified Maintenance Services

The Contractor must replace full or sectional lengths of Bridge Joints, seals and Bridge Joint Armours that are unsafe or have the potential to become unsafe; or that would accelerate the deterioration of elements such as Bearings, Bearing seats or Ballast Walls.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) re-seal and repair components of Bridge Joints and Bridge Joint Armours in accordance with Section B1 of the Introduction to these Maintenance Specifications;
- b) repair or re-seal Bridge Joints that are mis-aligned, cracked, worn, shrivelled, leaking, separated from joint walls or abraded;
- c) repair joint Anchor Bolts that are damaged, rusted, loose or missing;
- d) repair Armour that is bent, gouged, loose, separated or missing from the concrete Deck; and
- e) repair steel Finger Joints and Sliding Plate Joints that are loose, cracked, have broken welds or have missing components.

3.1.1 Performance Time Frames

The Contractor must:

- a) commence maintenance and repairs to Bridge Joints, Bridge Joint Armours and joint Anchor Bolts that are unsafe or have the potential to become unsafe immediately, from the time the deficiency was detected by or reported to the Contractor; and
- b) complete all maintenance and repairs to Bridge Joints, Bridge Joint Armours and joint Anchor Bolts which have the potential to reduce the functional life of the structure within the following times:

	Highway Classification				
	1 & 2	3	4	5	6 & 7
a) repair damaged Bridge Joint components	2 m	90 d	6 m	6 m	6 m
b) repair concrete and armour	4 m	6 m	6 m	6 m	6 m

Legend

d - days

m - months

3.2 Quantified Maintenance Services

The Contractor must replace Bridge Joints, seals and Bridge Joint Armours in accordance with Section B1 of the Introduction to these Maintenance Specifications, or the manufacturer's specifications, or the Bridge Structural Engineer's design, as applicable.

Notes:

1. The Contractor will not be required to perform complete replacement of Finger Joints under this Maintenance Specification.

2. If it is estimated by the Contractor and confirmed by the Province that, at any particular time, on any particular Bridge, the cost to replace Bridge Joints, seals or Bridge Joint Armours exceeds \$35,000, refer to Section G of the Introduction, unless it is mutually agreed to between the Province and the Contractor to continue to perform the work as Quantified Maintenance Services.
3.
 - The area of strip Bridge Joint seals will be determined by using the maximum rated gap according to the manufacturer's specifications, and multiplying that width by the length of seal installed;
 - The area of compression Bridge Joint seals will be determined by using the nominal width of uncompressed seal and multiplying that width by the length of seal installed;
 - The area of poured-in-place Bridge Joint seals will be determined by using the nominal width of Bridge Joint gap as measured at the time of placement and multiplying that width by the length of Bridge Joint filled.

3.2.1 Performance Time Frames

- a) The following table establishes the maximum time from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the replacement of Bridge joint seals:

Bridge Joint Seal Replacement	Summer Highway Classification	
	1 & 2	3,4,5,6,7 & 8
	4 m	6 m

Legend

m - months

- b) The Contractor must plan to perform all identified Bridge Joint replacements within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure

3.3 Materials

Refer to Section B1 of the Introduction to these Maintenance Specifications, or the manufacturer's specifications, or the Bridge Structural Engineer's design, as applicable.

4. WARRANTY

The Contractor warrants all Bridge Joint replacements against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-540

BRIDGE BEARING MAINTENANCE

1. OBJECTIVE

To ensure that Superstructure loads are properly transmitted and distributed to the Substructure and that the Superstructure is free to undergo necessary movements without developing damaging stresses that may limit the functional life of the Bridge.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must clean, lubricate, re-align, re-Grout and repair Bridge Bearings.

2.2 Quantified Maintenance Services

The Contractor must replace entire Bridge Bearings and associated components that are unsafe or have the potential to be unsafe or have deteriorated to the condition where maintenance and repair will not restore the original design function of the particular Bridge Bearing, as determined by the Bridge Structural Engineer.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) clean, lubricate, re-align, re-Grout and repair Bridge Bearings in accordance with the manufacturer's specifications or original design specifications;
- b) maintain and clean all Bridge Bearings and associated components that are rusty, mis-aligned, or are covered with Winter Abrasives, dirt or Debris;
- c) repair all pads that are damaged, crushed, cracked, split, bulging or torn;
- d) repair Anchor Bolts and Pins that are damaged or missing; and

- e) repair concrete pads and Bearing areas that are cracked or spalled.

3.1.1 Performance Time Frames

The Contractor must:

- a) immediately start repairs on Bridge Bearings that are unsafe or have the potential to become unsafe, as determined by a Bridge Structural Engineer;
- b) complete re-aligning and repairing Bearings, repairing or replacing Anchor Bolts and re-Grouting concrete pads and Bearing areas within 6 months from the time the deficiency was detected by or reported to the Contractor; and
- c) lubricate Bearings once annually or in accordance with the manufacturer's recommendation.

3.2 Quantified Maintenance Services

The Contractor must:

- a) replace deteriorated Bearings and associated components with a replacement Bearing as originally designed or as designed by the Bridge Structural Engineer;
- b) use an installation and jacking procedure, prepared by a Professional Engineer retained by the Contractor, and approved in writing by the Province;

Note: The Contractor will not be required to replace Bridge Bearings where the costs, including all associated components, Bridge jacking, engineering and traffic control, exceed \$35,000 for any particular Bridge Bearing, as calculated by the Bridge Structural Engineer unless mutually agreed by the Contractor and the Province. If the cost is \$35,000 or less, the Contractor and the Province will negotiate a price for the work to the limit of the Quantified Provisional Sum identified for such work within the Contract Year and the Contractor must complete such work in accordance with this Maintenance Specification.

3.2.1 Performance Time Frames

The Contractor and the Province will negotiate the time frames for each Bridge Bearing replacement.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

The Contractor warrants all Bridge Bearing replacements against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-560

BAILEY AND ACROW BRIDGE MAINTENANCE

1. OBJECTIVE

To ensure the safety of Highway Users and to maintain the structural integrity and a sufficient load-carrying capacity for the intended use.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain and store Emergency Bailey and Acrow bridging inventory.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) maintain Bailey and Acrow Bridges in accordance with Section B1 of the Introduction to these Maintenance Specifications;
- b) maintain, repair or replace all damaged or deteriorated Bailey and Acrow components;
- c) check and tighten Sway Braces, Transom Clamps, and Pins in accordance with the manufacturer's specifications; and
- d) perform welding repairs only with the prior written approval of the Province.

3.1.1 Performance Time Frames

The Contractor must:

- a) immediately notify the Province of any incidents of damage and report any indications of potential risk of structural failure in order that a Bridge Structural Engineer may conduct an assessment;
- b) if the Bridge Structural Engineer determines that there is a risk of structural failure under loading, immediately, as directed in writing by the Province, take the following actions:
 - i) restrict allowable loading of the Bridge;
 - ii) close the Bridge to all vehicular traffic; or
 - iii) close the Bridge to all use;
- c) within 48 hours, from the time the deficiency was detected by or reported to the Contractor, repair or replace any deficient components;
- d) notwithstanding 3.1.1 c), where any component is damaged or deteriorated, but still allows the Bridge to remain structurally sound without a reduction in the load-carrying capacity and to remain safe for Highway Users, as determined by a Bridge Structural Engineer, the components must be repaired or replaced by the Contractor within two months from the time the deficiency was detected by or reported to the Contractor;
- e) repair, replace and/or tighten Sway Braces, Transom Clamps, End Posts, Panel Pins or bolts within one day, from the time the deficiency was detected by or reported to the Contractor;
- f) replace or tighten any damaged, missing or loose bolts or Pins within two hours from the time the deficiency was detected by or reported to the Contractor; and
- g) tighten Sway Braces, Transom Clamps, and bolts annually.

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) provide Panels of the same steel section and steel grade as the Panels on the existing Bailey or Acrow Bridge. If an existing Bailey Bridge contains Panels of differing steel section and/or steel grade, then replacement Panels must be at least equal to the strength of the damaged Panel as indicated on the attached list of “Bailey Panel Types”;
- b) ensure Bailey BB1 “I” section Panels and American BB1 channel section Panels are not used as a replacement component in any assembled structure;
- c) refer to the Appendix to this Maintenance Specification for a list of acceptable Bailey Panel types; and
- d) refer to section B of the Introduction of these Maintenance Specifications for all other materials.

4. WARRANTY

Not applicable to this Maintenance Specification.

BAILEY/ACROW PANEL TYPES

- (i) - Bailey (BB1) with "I" – section verticals and diagonals.
 - Production pre-war to approximately 1979? by two manufacturers.
 - Earliest panels have smaller 6" x 6" mid-panel Gusset plates vs. more common 9" x 9" plates. Post 1970 panels have reinforcements at sway brace slots to improve fatigue resistance. Some panels TSBB1 circa 1970 had built-in Transom Clamps.
 - Strength: - steel grade 50C yield 51.5 ksi
 - allowable single-storey shear 33.6 kips
- (ii) - Bailey (BB1) Wartime AMERICAN Panels
 - These panels have channel-section verticals and diagonals. Steel members may have "U.S. Steel" rolling stamps or "Carnegie U.S.A."
 - The chord channels are 4" x 1 3/4", which are different than all other Bailey Panels which have 4" x 2" chord channels.
 - Strength data is unavailable. They are assumed to be as strong as the "I" section panels.
- (iii) - Bailey MJBB1 Super Panel
 - circa 1966
 - chords 4" x 2" channel
 - diagonals/verticals 3" x 1 1/2" channel
 - strength: - steel grade 50C yield 51.5 ksi
 - allowable single-storey shear 45 kips

Note: The "super" does not designate high strength steel; it merely designates that it is not a "I" section panel.
- (iv) - Bailey MJBB1001 Superlife Panels
 - circa 1970
 - same as MJBB1 but with improved fatigue details.
 - strength: - steel grade 50C yield 51.5 ksi
 - allowable single-storey shear 45 kips
- (v) - Bailey TSBB475 - Shear panels
 - 1970 to 1976?
 - Bailey TSBB1 - Low strength
 - circa 1979
 - Tubular verticals and diagonals; otherwise same as BB1
 - Strength: - steel grade 50C yield 51.5 ksi
 - allowable single-storey shear 54 kips

- (vi) - Bailey TSBB1 High strength
 - after 1980 or 1982?
 - identical to low-strength model - only way to distinguish is if panels/chords were marked or if a paper trail exists
 - Strength: - steel grade 55C yield 65 ksi
 - allowable single-storey shear 54 kips
- (vii) - Compact Bailey
 - These panels come in standard and high shear strength models. Transoms are located adjacent to verticals. No Rakers are used. Chord reinforcing comes in light and heavy sizes and need not be placed on all Truss lines. Strength: - steel grade 55C yield 65 ksi
 - allowable single-storey shear 50 kips standard
- (viii) - Acrow Series 100 or 300
 - These panels are unique. Transoms are located 2 per bay inside the diamonds. Rakers are used. Panel height is traditional 5 feet. Strength: - steel grade 55C yield 65 ksi
 - allowable single-storey shear 56 kips
- (ix) - Acrow Series 700
 - similar to series 100 except panel height is 7.5 feet
 - Chord reinforcing comes in light and heavy sizes and need not be placed on all truss lines. As of December 1994, no series 700 exists in Ministry stock.
- (x) - Universal Bridging
 - Similar to Compact Bailey except panel height is 8 feet. No Ministry stock as of December 1994.

Note: BB.....Bailey Bridging
 TS.....“Thomas Storey Ltd.”
 MJ.....“Mabey & Johnson Ltd.”

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-570

MINOR PAINTING OF BRIDGE STRUCTURES

1. OBJECTIVE

To prevent corrosion in steel components and rot in timber components of Bridge structures, and to present a neat and tidy appearance.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

The Contractor must maintain previously coated surfaces or apply new coated surfaces to Bridge structures and associated components.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.1.1 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor must:

- a) perform minor painting of Bridge structures and associated components in accordance with Section B1 of the Introduction to these Maintenance Specifications or the manufacturer's specifications;
- b) prepare and coat all surfaces of Bridge structures and steel rail systems to a minimum level of SSPC SP6, where the coating system is deteriorated, broken or damaged and the steel is corroding and rust is apparent; and

- c) prepare and coat surfaces of timber rail systems, where the coating system is deteriorated, broken or damaged.

3.2.1 Performance Time Frames

The Contractor must plan to perform all identified minor painting of Bridge structures within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

The Contractor must supply and use the same type and quality of material as on the existing structure or an alternate material as proposed by the Contractor and approved in writing by the Province.

4. WARRANTY

The Contractor warrants all minor painting of Bridge structures against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-600

CONCRETE STRUCTURE MAINTENANCE

1. OBJECTIVE

To restore and maintain the integrity and durability of concrete structures; to ensure the safety of Highway Users; and to maximize the functional life of the structures.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

The Contractor must maintain and repair concrete structures and associated components.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor must:

- a) maintain and repair concrete structures in accordance with Section B1 of the Introduction to these Maintenance Specifications or in accordance with the manufacturer's specifications;
- b) perform all concrete repairs in a manner that ensures a sound, durable, and well-bonded patch to the prepared surface;
- c) c remove all deteriorated concrete at the repair site;
- d) finish concrete surfaces to match the adjacent finished concrete surface profiles;

- e) not allow tolerances or deviations of concrete to exceed the following limits:
 - i) Deck surface $\pm 3\text{mm}$
 - ii) patches on other surfaces $\pm 5\text{ mm}$
 - iii) cross-sectional dimensions $\pm 25\text{ mm}$
 - iv) cover to Reinforcing Steel minimum 50 mm
 - v) separation from other reinforcing minimum 25 mm

Note: The above deviations are allowable only if they do not prevent the required fit of structural members;

- f) seal non-structural cracks;
- g) repair structural cracks by pressure injection of an epoxy material in accordance with the manufacturer's specifications;
- h) remove excess epoxy to match existing surface profile; and
- i) perform crack sealing of concrete wearing surfaces in accordance with the Maintenance Specification for *Bridge Deck Maintenance*, with credit for such work under the Maintenance Specification for *Bridge Deck Maintenance*.

Note: If it is estimated by the Contractor and confirmed by the Province that at any particular time, at any particular Bridge, the cost of maintaining or repairing concrete structures or associated components exceeds \$35,000, refer to Section G of the Introduction to these Maintenance Specifications; unless it is mutually agreed to between the Province and the Contractor to continue to perform the work as Quantified Maintenance Services.

3.2.1 Performance Time Frames

The Contractor must:

- a) notify the Province immediately, from the time the deterioration or damage to the concrete structure was detected by or reported to the Contractor;

- b) respond immediately if the Bridge Structural Engineer determines that there is risk of structural failure under loading, by doing one of the following, as approved in writing by the Province:
 - (i) restrict allowable loading on the structure;
 - (ii) close the structure to all vehicular traffic;
 - (iii) close the structure to all use;
 - (iv) start repairs immediately as instructed by the Bridge Structural Engineer;
 - (v) complete repairs within three months, or within a time frame that is appropriate to the nature and urgency of the repair as determined by the Bridge Structural Engineer;
- c)
 - c) **complete all other** concrete repairs within 6 months, from the time the deficiency was detected by or reported to the Contractor;
 - d) perform epoxy injection within 6 months, from the time the deficiency was detected by or reported to the Contractor; and
 - e) plan to perform all identified concrete structure repairs within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

The Contractor must:

- a) supply and use materials of the same type and quality as the existing material or refer to Section B of the Introduction to these Maintenance Specifications;
- b) meet the following concrete mixes and patching material specifications:

	minimum compressive strength at 28 days	maximum nominal size aggregate mm	maximum Water/Cement ratio by weight	air content %	Slump maximum mm
1. Deck and Parapet	35 MPa	20	0.42	6 (+/-1)	50
2. Abutments, Piers and Footings	30 MPa	28	0.45	5 (+/-1)	75

- c) achieve minimum 28 day compressive strength of 35 MPa for Cementitious, non-shrink, non-metallic Grout which may be polymer-modified.

4. WARRANTY

The Contractor warrants all concrete structure repairs against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-605

STEEL AND ALUMINUM STRUCTURE MAINTENANCE

1. OBJECTIVE

To restore and maintain the integrity and durability of steel and aluminum structures; to ensure the safety of Highway Users; and to maximize the functional life of the structures.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain and repair steel and aluminum structures and associated components that are unsafe or have the potential to become unsafe.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) maintain and repair steel and aluminum structures;
- b) repair and/or replace lost, missing, deteriorated, or corroded rivets, bolts and associated components, including but not limited to, catwalks, ladders, working platforms and fall arrest systems;
- c) replace deteriorated steel or aluminum members; and

Note: If it is estimated by the Contractor and confirmed by the Province that, at any particular time, and at any particular structure, the cost to maintain or repair a steel and aluminum structure exceeds \$35,000, refer to Section G of the Introduction.

3.1.1 Performance Time Frames

The Contractor must:

- a) notify the Province immediately, from the time the deterioration or damage to the steel and aluminum structure was detected by or reported to the Contractor;
- b) respond immediately if the Bridge Structural Engineer determines that there is risk of structural failure under loading, by doing one of the following, as approved in writing by the Province:
 - (i) restrict allowable loading on the structure;
 - (ii) close the structure to all vehicular traffic;
 - (iii) close the structure to all use;
 - (iv) start repairs immediately as instructed by the Bridge Structural Engineer;
 - (v) complete repairs within three months, or within a time frame that is appropriate to the nature and urgency of the repair as determined by the Bridge Structural Engineer; and
- c) complete all other steel and aluminum structure maintenance within four months, from the time the deficiency was detected by or reported to the Contractor.

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 supply and use materials of the same type and quality as the existing material or refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-620

TIMBER TRUSS BRIDGE MAINTENANCE

1. OBJECTIVE

To preserve the durability and load carrying capacity of the structures.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must:

- a) maintain and repair timber Truss Bridges and associated components;
- b) repair timber Truss Portals; and
- c) tighten, repair or replace fastening hardware.

2.2 Quantified Maintenance Services

The Contractor must replace timber Truss End Posts, Truss Rods, Truss Portals, all Braces, Floor Beams and corbels.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) maintain and repair deteriorated timber Truss Bridge components in accordance with the specifications referred to in Section B1 of the Introduction to these Maintenance Specifications or in accordance with the original design specifications;
- b) tighten Flashing; and tighten and replace all fasteners;
- c) treat all freshly sawn or drilled timber members with preservatives;
- d) repair or replace deteriorated cast components;
- e) replace Flashing that is torn, missing or otherwise required to be installed for protection of the structure;

- f) Camber top and bottom Laminated Chords by tightening all Truss Rods evenly and systematically until all Counter Braces are bearing at both ends; the procedure for doing so must be approved in writing by the Province;
- g) refrain from excessive tightening of Truss Rods in an attempt to lift more Camber into the Truss; in the event that the Chord Cambers are not smooth or even in profile after all Counter Braces are bearing both ends, the Province may require the Contractor to Shim and/or cut Counter Brace lengths;
- h) tighten all Lateral Rods evenly to maintain a straight and uniform Chord line; and
- i) refrain from patching, welding or splicing, unless a procedure is prepared by a Professional Engineer retained by the Contractor and approved in writing by the Province.

3.1.1 Performance Time Frames

The Contractor must:

- a) initiate Traffic Control in accordance with the Maintenance Specification for *Highway Traffic Control*, immediately from the time a deficiency is detected by or reported to the Contractor that may affect the structure and/or the safety of Highway Users;
- b) notify the Province immediately so that the Bridge Structural Engineer can be assigned to assess the deficiency and risk of structural failure;
- c) respond immediately if the Bridge Structural Engineer determines that there is risk of structural failure under loading, by doing one of the following, as approved in writing by the Province:
 - i) restrict allowable loading on the Bridge;
 - ii) close the Bridge to all vehicular traffic; or

- iii) close the Bridge to all use;
 - iv) immediately commence maintenance repairs after receiving instructions from the Bridge Structural Engineer, except where the damage will require complete re-construction of the structure as determined by the Province;
- d) complete the repair of the following deficiencies within the maximum time, from the time the deficiency was detected by or reported to the Contractor:

Component and Damage		Action and Maximum Response Time
i)	torn, loose or missing Flashing	repair or replace within 6 m
ii)	Flashing not previously installed	install within 12 m
iii)	non-structural damage or deterioration to Portals, Braces and lateral Braces	repair within 6 m
iv)	damaged or loose Truss Rods; damaged, loose, or missing fasteners	repair within 2 m
vi)	adjusting the Camber	as required

Legend

m - months

3.2 Quantified Maintenance Services

The Contractor must replace deteriorated timber Truss components in accordance with the specifications referred to in Section B1 of the Introduction to these Maintenance Specifications or in accordance with the original design specifications.

Notes:

1. The Contractor will not be responsible for replacing structural members associated with complete Bridge replacement or complete replacement of either top or bottom Chords unless mutually agreed between the Contractor and the Province.
2. If it is estimated by the Contractor and confirmed by the Province that, at any particular time, and at any particular Bridge, the cost to replace timber Truss components exceeds \$35,000, refer to Section G of the Introduction, unless it is mutually agreed to between the Province and the Contractor to continue to perform the work as Quantified Maintenance Services. .

3.2.1 Performance Time Frames

The Contractor must:

- a) replace Truss Rods or Lateral Rods, or deteriorated End Posts, Main Braces, Counter Braces, Floor Beams and/ or corbels within 2 months from the time the deficiency was detected by or reported to the Contractor; and
- b) plan to perform all identified timber Truss component replacements within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year, the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure

3.3 Materials

Supply and use materials of the same type and quality as the existing material or refer to Section B1 of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-640

BRIDGE PILING MAINTENANCE

1. OBJECTIVE

To ensure structural strength, to prevent Scour and to maintain the impact resistance of Bridge Pilings.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain and repair Pilings, Trash Racks and associated components that are unsafe or have the potential to become unsafe for Highway Users.

2.2 Quantified Maintenance Services

The Contractor must replace deteriorated Bridge Pilings and associated components where maintenance and repair will not restore the original design function of the particular Piling, as determined by the Bridge Structural Engineer.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) maintain or repair damaged Bridge Pilings and associated components as required in accordance to the specifications referred to in Section B1 of the Introduction to these Maintenance Specifications;
- b) splice Piles only if the base of the Pile is sound;
- c) tighten loose cables and fasteners;
- d) replace broken or missing cables and fasteners;
- e) repair or replace damaged or missing Flashing and Armour; and install Flashing and Armour where previously none was in place;

- f) repair damaged Trash Racks; and
- g) remove accumulated Debris as soon as access permits and dispose of Debris in a manner acceptable to regulatory agencies.

3.1.1 Performance Time Frames

The Contractor must:

- a) initiate Traffic Control in accordance with the Maintenance Specification for *Highway Traffic Control*, immediately from the time a deficiency is detected by or reported to the Contractor that may affect the structure and/or the safety of Highway Users;
- b) notify the Province immediately so that the Bridge Structural Engineer can be assigned to assess the deficiency and risk of structural failure;
- c) respond immediately if the Bridge Structural Engineer determines that there is risk of structural failure under loading, by doing one of the following, as approved in writing by the Province:
 - i) restrict allowable loading on the Bridge;
 - ii) close the Bridge to all vehicular traffic; or
 - iii) close the Bridge to all use;
 - iv) commence repairs within 2 days after receiving instructions from the Bridge Structural Engineer, except where the damage will require complete re-construction as determined by the Province, unless mutually agreed by the Contractor and the Province; and
- d) complete maintenance and repair to Pilings and associated components within 6 months from the time the deficiency was detected by or reported to the Contractor.

3.2 Quantified Maintenance Services

The Contractor must:

- a) replace Pilings and associated components in accordance with Section B1 of the Introduction to these Maintenance Specifications;
- b) use Pile types and installation procedures, prepared by a Professional Engineer retained by the Contractor, and approved in writing by the Province; and
- c) replace Trash Racks that cannot be repaired.

Notes:

- 1. The Contractor is not responsible for replacing concrete Bridge Piles under this Maintenance Specification.
- 2. The Contractor will not be required to replace Piles where the costs, including all associated components, Bridge jacking, engineering and traffic control, exceed \$35,000, at any particular time, for a Piling located at a particular structure, as calculated by the Bridge Structural Engineer unless mutually agreed by the Contractor and the Province. If the cost is \$35,000 or less, the Contractor and the Province will negotiate a price for the work to the limit of the Quantified Provisional Sum identified for such work within the Contract Year.

3.2.1 Performance Time Frames

The Contractor must:

- a) commence emergency replacement of Bridge Piles and associated components within 2 days, from the time directed to do so by the Province, where the safety of Highway Users and structural integrity is compromised, except where the damage requires complete re-construction of the Pile Bent or Bridge structure, as determined by the Province; and
- b) complete non-emergency replacement of Piles and associated components within 6 months, from the time the deficiency was detected by or reported to the Contractor;

3.3 Materials

Refer to Section B1 of the Introduction to these Maintenance Specifications.

4. WARRANTY

The Contractor warrants all Pile replacements against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-650

TIMBER AND LOG STRUCTURE MAINTENANCE

1. OBJECTIVE

To preserve the durability and load carrying capacity of timber and log structures.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain and repair all timber and log structures and their associated components that are unsafe or have the potential to become unsafe.

2.2 Quantified Maintenance Services

The Contractor must replace timber and log Stringers, Brow Logs, Needle Beams and timber Caps where maintenance and repair will not restore the original design function of the particular structure, as determined by the Bridge Structural Engineer.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) maintain and repair timber and log structures and associated components in accordance with Section B1 of the Introduction of these Maintenance Specifications;
- b) ensure that the durability and load carrying capacity of the structure is maintained while repairing the structure; and
- c) bolt Brow Logs (not cable-wrap them) to the log Stringers or Needle Beams.

3.1.1 Performance Time Frames

The Contractor must:

- a) initiate Traffic Control in accordance with the Maintenance Specification for *Highway Traffic Control*, immediately from the time a deficiency is detected by or reported to the Contractor that may affect the structure and/or the safety of Highway Users;
- b) notify the Province immediately so that the Bridge Structural Engineer can be assigned to assess the deficiency and risk of structural failure;
- c) respond immediately if the Bridge Structural Engineer determines that there is risk of structural failure under loading, by doing one of the following, as approved in writing by the Province:
 - i) restrict allowable loading on the Bridge;
 - ii) close the Bridge to all vehicular traffic; or
 - iii) close the Bridge to all use;
 - iv) commence repairs within 2 days after receiving instructions from the Bridge Structural Engineer, except where the damage will require complete re-construction as determined by the Province, unless mutually agreed by the Contractor and the Province; and
- d) complete maintenance and repairs to timber or log structures in accordance with the times, from the time the deficiency was detected by or reported to the Contractor, established in the following table:

Activity	Highway Classification	
	1, 2 & 3	4, 5, 6 & 7
repair timber or log Stringers, Brow Logs, Needle Beams and Caps	3 m	6 m
repair Braces and other structural components	3 m	6 m
install temporary support	3 m	6 m
tighten loose timber joints, bolts, fastenings, cables and other structural components	1 m	4 m

Legend

m – months

3.2 Quantified Maintenance Services

The Contractor:

- a) must replace timber and log Stringers, Brow Logs, Needle Beams and timber Caps in accordance Section B1 of the Introduction to these Maintenance Specifications; and
- b) must construct temporary support, in a manner approved in writing by the Province, when replacing timber Stringers, Caps and Braces.

Notes:

- c)
 - 1. The Contractor will not be responsible for replacing Laminated Stringers.
 - 2. The Contractor will not be responsible for replacing timber or log stringers associated with complete Bridge replacement, unless mutually agreed between the Contractor and the Province.

3.2.1 Performance Time Frames

- a) The following table establishes the maximum time, from the time the deficiency was detected by or reported to the Contractor, within which the Contractor must complete the repair of the following deficiencies:

Maximum Response Times		
	Highway Classification	
Quantified Maintenance Activity	1, 2 & 3	4, 5, 6 & 7
replace timber or log Stringers, Brow Logs, Needle Beams and Caps	3 months	6 months

- b) The Contractor must plan to perform all identified timber and log structure component replacement within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year, the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure.

3.3 Materials

The Contractor must:

- a) refer to section B1 of the Introduction to these Maintenance Specifications; and
- b) replace timber material with preservative-treated Douglas Fir timber of the following standard sizes, unless otherwise approved by the Province in writing;
 - i) timber Stringers, 150 mm x 400 mm (6 inch x 16 inch) select structural grade or as specified or directed by the Province;
 - ii) timber Caps, Sills 305 mm x 305 mm minimum (12 inch x 12 inch) Number 1 grade;
 - iii) timber Box Beam Caps 305 mm x 355 mm (12 inch x 14 inch) Number 1 grade; and
- c) logs for structural repair must be cut from live Cedar or Douglas Fir species, and must be cut in mid-winter and allowed to cure for a minimum of 30 days prior to peeling and placing, unless otherwise approved in writing by the Province.

4. WARRANTY

The Contractor warrants all timber and log structure component replacements against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-660

RETAINING STRUCTURE MAINTENANCE

1. OBJECTIVE

To ensure the continued safe and stable condition of all Retaining Structures and associated components.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must clean out Debris behind the Retaining Structures and maintain and repair Retaining Structures and associated components that are unsafe or have the potential to become unsafe for Highway Users.

2.2 Quantified Maintenance Services

The Contractor must replace Retaining Structure components where maintenance and repair will not restore the original function of the structure.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) repair Retaining Structure components in accordance with Section B1 of the Introduction to these Maintenance Specifications;
- b) repair or reinforce any portion of a Retaining Structure showing signs of deterioration, deflection or settlement;
- c) repair Retaining Structures showing signs of continued movements, as recommended by a Geotechnical Engineer in consultation with a Bridge Structural Engineer, and as approved in writing by the Province;

- d) repair timber and log Retaining Structure components in accordance with the Maintenance Specification for *Bridge Piling Maintenance* (subject to section 3.2.1 b), with no credit for this work under the Maintenance Specification for *Bridge Piling Maintenance*;
- e) clean out accumulations of Debris behind Retaining Structures when the Debris prevents the Retaining Structure from functioning as designed; and dispose of Debris in a manner acceptable to regulatory agencies; and
- f) perform traffic control in accordance with the Maintenance Specification for *Highway Traffic Control*, whenever a structure and/or the safety of Highway Users is threatened.

3.1.1 Performance Time Frames

The Contractor must:

- a) initiate Traffic Control in accordance with the Maintenance Specification for *Highway Traffic Control*, immediately from the time a deficiency is detected by or reported to the Contractor;
- b) commence maintenance repairs within 24 hours from receiving written approval by the Province to proceed;
- c) maintain and repair Retaining Structure deficiencies within the time, from the time the deficiency was detected by or reported to the Contractor, established in the table below:

	1 & 2	3	4	5, 6 & 7
Maximum Response Time	1 m	2 m	4 m	6 m

- d) clean out accumulations of Debris behind Retaining Structures annually, or as required to ensure the structure functions as designed.

Legend

m – months

3.2 Quantified Maintenance Services

The Contractor must:

- a) replace components of Retaining Structures in accordance with Section B1 of the Introduction to these Maintenance Specifications;
- b) replace concrete Retaining Structure components in accordance with the Maintenance Specification for *Concrete Structure Maintenance* (subject to section 3.2.1 b), with credit for this work under the Maintenance Specification for *Concrete Structure Maintenance*; and
- c) replace timber and log Retaining Structure components in accordance with the Maintenance Specification for *Bridge Piling Maintenance* (subject to section 3.2.1 b), with credit for this work under the Maintenance Specification for *Bridge Piling Maintenance*.

Note: The Contractor will not be responsible for replacing entire Retaining Structures, unless mutually agreed to by the Contractor and the Province.

3.2.1 Performance Time Frames

The Contractor must:

- a) complete the replacement of Retaining Structure components within six months, from the time the deficiency was detected by or reported to the Contractor;
- b) comply with the Performance Time Frames in this Maintenance Specification and not the respective Performance Time Frames outlined in the *Concrete Structure Maintenance* and the *Bridge Piling Maintenance*; and
- c) plan to perform all identified Retaining Structure component replacement within the Contract Year to the limit of the identified quantities. Where identified work exceeds the available quantities in any Contract Year, the Contractor must ensure identified repairs are carried out in order of priority to ensure safety and to protect the infrastructure

3.3 Materials

The Contractor must:

- a) refer to Section B1 of the Introduction to these Maintenance Specifications; and
- b) supply timber material that is incised and preservative-treated Douglas Fir, Number 2, minimum size (150 mm x 200 mm) or the same size, as existing.

4. WARRANTY

The Contractor warrants all Retaining Structure maintenance against defects for a period of 365 days from the completion of those Maintenance Services. The Contractor must rectify all defects covered by this warranty and all other ancillary work performed under other Maintenance Specifications, without credit for such work, within 1 month of detection by or notification to the Contractor by the Ministry.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-680

MULTIPLATE STRUCTURE MAINTENANCE

1. OBJECTIVE

To allow unimpeded flow through Multiplate structures and to maximize the functional life of these structure.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain, repair and/or replace components of Multiplate structures and bank and watercourse protection that are unsafe or have the potential to become unsafe for Highway Users or adversely effect the functional life of the structure.

2.2 Quantified Maintenance Services

- a) Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) maintain repair and/or replace Multiplate structure components in accordance with Section B1 of the Introduction to these Maintenance Specifications;
- b) protect the floor area using steel plates or concrete, as instructed by the Bridge Structural Engineer or as approved in writing by the Province;
- c) replace Scoured and/or eroded foundation material at the inlet, outlet, shore, bank and watercourse with concrete or angular rock in accordance with the Maintenance Specification for *Shore, Bank and Watercourse Maintenance* (subject to section 3.1.1 f), with credit for such work under the Maintenance Specification for *Shore, Bank and Watercourse Maintenance*;

- d) maintain and repair concrete in accordance with the Maintenance Specification for *Concrete Structure Maintenance* (subject to section 3.1.1 f), with credit for such work under the Maintenance Specification for *Concrete Structure Maintenance*; and
- e) maintain and repair asphalt surfaces in accordance with the Maintenance Specification for *Highway Pavement Patching and Crack Sealing* (subject to section 3.1.1 f), with credit for such work under the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*.

Note: If it is estimated by the Contractor and confirmed by the Province that, at any particular time, at any particular structure, the cost of maintaining, repairing or replacing components of a Multiplate structure exceeds \$35,000, refer to Section G of the Introduction to these Maintenance Specifications.

3.1.1 Performance Time Frames

The Contractor must:

- a) initiate Traffic Control in accordance with the Maintenance Specification for *Highway Traffic Control*, immediately from the time a deficiency is detected by or reported to the Contractor that may affect the structure and/or the safety of Highway Users;
- b) notify the Province immediately so that the Bridge Structural Engineer can be assigned to assess the deficiency and risk of structural failure;
- c) respond immediately if the Bridge Structural Engineer determines that there is risk of structural failure under loading, by doing one of the following, as approved in writing by the Province:
 - i) restrict allowable loading on the Multiplate structure;
 - ii) close the Multiplate structure to all vehicular traffic; or
 - iii) close the Multiplate structure to all use;
- c) **d)** tighten or replace loose, damaged or missing bolts within 10 days, from the time the deficiency was detected by or reported to the Contractor, or as soon as conditions allow;

- f) e) repair Multiplate structures and protect the Multiplate structure from Scour and erosion to the inlet, outlet and foundation, within 6 months from the time the deficiency was detected by or reported to the Contractor; and
- f) comply with the Performance Time Frames in this Maintenance Specification and not the respective Performance Time Frames outlined in the *Maintenance Specification for Concrete Structure Maintenance; Highway Pavement Patching and Crack Sealing; and Shore, Bank and Watercourse Maintenance*.

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

Refer to section B1 of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-690

BRIDGE RAILING MAINTENANCE

1. OBJECTIVE

To provide a structurally sound and safe barrier between pedestrians, vehicles and hazards and to maximize the functional life of the Bridge railing.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must maintain, repair and replace, as required, Bridge rail systems and Parapets that are unsafe or have the potential to become unsafe for Highway Users.

2.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

The Contractor must:

- a) maintain, repair and replace Bridge rail systems and Parapets to original design;
- b) perform concrete repairs in accordance with the Maintenance Specification for *Concrete Structure Maintenance* (subject to section 3.1.1 e), with credit for such work under the Maintenance Specification for *Concrete Structure Maintenance*;
- c) perform minor painting of Bridge rail systems in accordance with the Maintenance Specification for *Minor Painting of Bridge Structures* (subject to section 3.1.1 e), with credit for such painting under the *Minor Painting of Bridge Structures*;
- d) install a temporary barrier or railing where required, to ensure the safety of Highway Users; and

- e) perform traffic control, as required, in accordance with the Maintenance Specification for *Highway Traffic Control*.

Note: If it is estimated by the Contractor and confirmed by the Province that at any particular time, at any particular Bridge, the cost of maintaining, repairing or replacing deficient Bridge railings exceeds \$35,000, refer to Section G of the Introduction to these Maintenance Specifications.

3.1.1 Performance Time Frames

The Contractor must:

- a) immediately notify the Province of any deficiency of any Bridge railing which is unsafe or has the potential to become unsafe for Highway Users;
- b) immediately provide traffic control under situations described in 3.1.1 a);
- c) complete installation of temporary railing, as required, within 24 hours, from the time the deficiency was detected by or reported to the Contractor;
- d) complete maintenance, repairs and/or replacement within 2 months, from the time the deficiency was detected by or reported to the Contractor; and
- e) comply with the Performance Time Frames in this Maintenance Specification and not the respective Performance Time Frames outlined in the *Concrete Structure Maintenance and Minor Painting of Bridge Structures*.

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

- a) Refer to Section B of the Introduction to these Maintenance Specifications; and
- b) in accordance with the following:
 - i) timber must be Number 1 Douglas Fir species and must meet the following minimum specifications:
 - 1. timber End Posts must be rough cut and 250 mm x 250 mm (10 inch x 10 inch), intermediate posts must be S2E 150 mm x 150 mm (6 inch x 6 inch);
 - 2. timber railing must be S4S 75 mm x 200 mm (3 inch x 8 inch x 16 feet) or as approved in writing by the Province, fastened with 200 mm Galvanized nails;
 - 3. timber Wheelguards must be untreated, rough cut to and 200 mm x 200 mm x 4.9 metres (8 inch x 8 inch x 16 feet) or as otherwise approved by the Province, and maximum Wane allowed on any surface must be 10 mm; and
 - ii) all fasteners must be hot-dip Galvanized.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 6-740

DEBRIS TORRENT STRUCTURE MAINTENANCE

1. OBJECTIVE

To ensure the safety of Highway Users and to ensure the continued structural and functional integrity of Debris Torrent Structures.

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) maintain, repair and/or replace components of Debris Torrent Structures in accordance with Section B1 of the Introduction to these Maintenance Specifications;
- b) remove Debris from the Flume, basin area, and from around the Debris Torrent Structure;
- c) remove any blockage or sediment from relief wells to ensure free drainage into the discharge manifold;
- d) remove and replace all dissipater panels that are damaged or worn, as determined by the Province;
- e) maintain all piezometers associated with Debris Torrent Structures as directed by the Province;

- f) maintain all paved Highway surfaces including access Highways and parking areas in accordance with the Maintenance Specification for *Highway Pavement Patching and Crack Sealing* (subject to 3.1.1e), with credit for such work under the Maintenance Specification for *Highway Pavement Patching and Crack Sealing*;
- g) maintain grillage beams and all concrete structures in accordance with the Maintenance Specification for *Concrete Structure Maintenance* (subject to 3.1.1e), with credit for such work under the Maintenance Specification for *Concrete Structure Maintenance*; and
- h) seal concrete cracks in accordance with the Maintenance Specification for *Bridge Deck Maintenance* (subject to 3.1.1e), with credit for such work under the Maintenance Specification for *Bridge Deck Maintenance*.

Note: If it is estimated by the Contractor and confirmed by the Province that at any particular time and at any particular structure, the cost to maintain, repair or replace components of a structure exceeds \$35,000, refer to Section G of the Introduction to these Maintenance Specifications.

3.1.1 Performance Time Frames

The Contractor must:

- a) clear Flume and basin areas of Debris within one month of any Debris Event or as specified by the Province;
- b) clear Flume and basin areas of Debris at least once annually;
- c) repair or replace damaged grillage beams, concrete surfaces, dissipater panels, asphalt pavements, piezometers and relief wells within two months from the time the deficiency was detected by or reported to the Contractor;
- d) clean relief wells at least once annually; and
- e) comply with the Performance Time Frames in this Maintenance Specification and not the respective Performance Time Frames outlined in the *Pavement Patching and Crack Sealing*, *Concrete Structure Maintenance* and *Bridge Deck Maintenance*.

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

Refer to section B1 of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 7-760

FLOOD CONTROL AND WASHOUT RESPONSE

1. OBJECTIVE

To safeguard Highway Users and adjacent properties; to prevent damage to Highways and Bridges; to restore traffic movement and to repair damage caused by flood and washout events.

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) prepare for floods and washouts;
- b) take all actions required to control the flow of water on or adjacent to Highways;
- c) take all actions required to protect the Highway, including placing Rip-rap in accordance with the Maintenance Specification for *Shore, Bank and Watercourse Maintenance*, with no credit for such work under the Maintenance Specification for *Shore, Bank and Watercourse Maintenance*, unless mutually agreed to between the Province and the Contractor;
- d) repair any damage to Highway infrastructure resulting from floods and/or washout events in accordance with the relevant Maintenance Specifications, with no credit for such work under those Maintenance Specifications, unless mutually agreed to between the Province and the Contractor;

- e) provide traffic control in accordance with the Maintenance Specification for *Highway Traffic Control*;
- f) close sections of a Highway, as approved in writing by the Province, and provide detours of up to a maximum additional travel length of 3.5 kilometres, where necessary;
- g) patrol effected Highways in accordance with the Maintenance Specification for *Highway Patrol*.

Note: Refer to Section H of the Introduction to these Maintenance Specifications.

3.1.1 Performance Time Frames

The Contractor must:

- a) inspect immediately, from the time the deficiency was detected by or reported to the Contractor, any potential for damage caused by flooding or washout conditions, and implement traffic control as necessary;
- b) when an event of a flood or washout effects the Travelled Lanes, immediately establish at least one through lane for traffic, and commence work to restore the Highway;
- c) immediately inform the Province where floods or washouts result in Highway closures;
- d) within 2 days of the end of the storm or other event, identify any potential for flooding and/or washout and notify the Province, in writing, with a complete list of the locations;
- f) perform flood control and washout response in accordance with the Maximum Response Times indicated in the table below:

Washout Category	Summer Highway Classification				
	1&2	3	4	5	6&7
(i) washouts completely cutting a Highway and isolating a community	45 min	1 h	90 min	150 min	4 h
(ii) washouts completely cutting a numbered route or main Highway other than those covered by (i) above	90 min	2 h	3 h	n/a	n/a
(iii) washouts cutting one or more lanes of a Highway	4 h	6 h	9 h	15 h	24 h

Legend

h - hours

min – minutes

3.2 Quantified Maintenance Services

Not Applicable to this Maintenance Specification.

3.3 Materials

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 7-770

MUD, EARTH AND ROCK SLIDE RESPONSE

1. OBJECTIVE

To safeguard Highway Users and adjacent properties; to restore traffic movement and to repair damage to Highways and Bridges caused by mud, earth and rock slides.

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 traffic control in accordance with the Maintenance Standard for *Highway Traffic Control*, in response to a mud, earth or rock slide ;
- b) provide detours around the effected section of Highway of up to a maximum additional travel length of 3.5 kilometres, where necessary;
- c) remove mud, earth or rock deposits effecting the function of the Highway;
- d) monitor and patrol areas suspected of being unstable, as directed by the Province;

- e) control locations subject to slides exceeding 100 cubic metres of mud, earth or rock. The Province will arrange for a Geotechnical Engineer to investigate the site and the Contractor must perform work in accordance with the recommendations of the Geotechnical Engineer to prevent rockfall from reaching the Shoulder top and Travelled Lanes; and
- f) repair any damage to Highway infrastructure resulting from mud, earth and rock slide events in accordance with the appropriate Maintenance Specification, with no credit for such work under those Maintenance Specification, unless mutually agreed to between the Province and the Contractor.

Notes:

- 1. Slope stability treatment involving rock bolting, wire mesh or geofabric installation is not required by this Maintenance Specification.
- 2. Refer to Section H of the Introduction to these Maintenance Specifications.

3.1.1 Performance Time Frames

The Contractor must:

- a) inspect immediately, from the time the deficiency was detected by or reported to the Contractor, any potential for damage caused by mud, earth or rock slides, and implement traffic control as necessary;
- b) when an event of a mud, earth or rock slide effects the Travelled Lanes, immediately establish at least one through lane for traffic, and commence work to restore the Highway;
- c) immediately inform the Province where slides result in Highway closures;
- d) within 2 days of the end of the storm or other event, identify any potential for flooding and/or washout and notify the Province, in writing, with a complete list of the locations;
- e) control, at times directed by the Province, all known locations that are subject to annual slides of less than 100 cubic metres of mud, earth or rock;

- f) control locations subject to slides exceeding 100 cubic metres of mud, earth or rock in accordance with the recommendation of the Geotechnical Engineer;
- g) immediately advise the Province in the event of a slide exceeding 100 cubic metres effecting the Highway, or if there are indications of a potential slide of this size or greater; and
- h) start repairs in accordance with the maximum response times established in the table below:

		S H Cla igation				
		1 & 2	3	4	5	6 & 7
(i)	slides completely blocking a Highway and isolating a community	45 min	1 h	90 min	150 min	4 h
(ii)	slides completely blocking a numbered route or main Highway not included in (i) above	90 min	2 h	3 h	n/a	n/a
(iii)	slides blocking only one or more lanes and restricting traffic	4 h	6 h	9 h	15 h	24 h

Legend

h – hours

min - minutes

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

Refer to Section B of the Introduction.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification 7-780

HIGHWAY INCIDENT AND VANDALISM RESPONSE

1. OBJECTIVE

To protect Highway Users from conditions that are unsafe or have the potential to become unsafe; and to restore the movement of traffic.

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 initial traffic control in accordance with the Maintenance Specification for *Highway Traffic Control*, in response to incidents on the Highway e.g., motor vehicle accidents, spills) until police and/or other authorities arrive at the scene; if no other authorities are required to attend the scene, the Contractor will remain at the scene until normal traffic flow is restored;
- b) prepare for and respond to incidents and vandalism on Highways by:
 - i) securing the area as required to ensure the safety of Highway Users;
 - ii) communicating incidents involving Highway closures to the Province in accordance with the Maintenance Specification for *Highway Condition Reporting*;

- iii) containing spills on Highways in conjunction with and cooperation with regulatory agencies, police authorities and the Province;
 - iv) removing vehicles from the Travelled Lanes and Shoulders, as necessary (where this service is not provided by others);
 - v) removing and disposing of cargo and Debris from the Travelled Lanes and Shoulders, to restore traffic flow;
 - vi) documenting all associated costs of removing vehicles, cargo and Debris from the Highway;
 - vii) completing a Chargeable Maintenance Costs report and forwarding that report to the Province; and
 - viii) repairing any damage to Highways caused by incidents or vandalism in accordance with the applicable Maintenance Specification, with credit for such work under the applicable Maintenance Specification if the cost of such work is not recovered under Chargeable Maintenance Costs.
- c) ensure the safety of Highway Users in the event of a spill within Rights-of-way involving Dangerous Goods as defined in the Transportation of Dangerous Goods Act and Regulations (TDG) in accordance with the Canutec Emergency Response Guidebook (ERG) by:
- i) alerting the Province, police authorities, and Provincial Emergency Program personnel, as required to identify the material and respond to the emergency, and respond as appropriate and in accordance with all applicable laws and regulations;
 - ii) training field personnel and field supervisors in accordance with all applicable laws and regulations for Dangerous Goods material identification and risk assessment; and
 - iii) closing and keeping the Highway closed using, at minimum, Guide 111 of the ERG until the hazard and/or material is identified and appropriate actions have been determined and performed in accordance with all applicable guides, laws and regulations;

Note: Transport Canada's Response and Operations Division operates CANUTEC to provide a 24-hour Dangerous Goods reference, data bank and expert assistance service.

- d) **d)** _____evacuating the area if an explosion is possible;
- e) establishing and recording information as per TDG Regulation Part 8; 8.1- 8.3; and the WCB Act Division 10 – 172; and
- f) documenting traffic incidents attended by the Contractor, i.e. taking photographs, diary notes, recording Highway conditions and locations relating to; and delivering such documents to the Province, when requested.

Note: Parties responsible for the incident, their insurers, or agencies which have jurisdiction over the incident are expected to bear all of the costs of vehicle recovery, cleanup, accident investigation and traffic control. Notwithstanding the above, should the Contractor determine that actions undertaken by others, or failed to be undertaken by others, have the potential to present a hazard to Highway Users, the Contractor will take all necessary actions to protect Highway Users and may submit a claim to the Province for cost recovery.

3.1.1 Performance Time Frames

The Contractor must:

- a) immediately, from the time the incident was detected by or reported to the Contractor, implement traffic control;
- b) within 3 days of the date of request by the Province, forward all photographs, documentation and records;
- c) repair damage to Highways in accordance with the appropriate Maintenance Specification and their Performance Time Frames; and
- d) within one week of the incident or act of vandalism, complete a Chargeable Maintenance Cost report and send photographs of the damage .

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

Refer to Section B of the Introduction.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 7-790

SNOW AVALANCHE RESPONSE

1. OBJECTIVE

To safeguard Highway Users against avalanches and to minimize road closures.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

The Contractor must:

- a) respond to snow avalanches in accordance with the following Ministry of Transportation Snow Avalanche Manuals:
 - i) Snow Avalanche Safety Measures for Highways Manual;
- b) consider the following while planning and carrying out work:
 - i) the safety of Highway Users who travel through or within designated avalanche hazard areas; and
 - ii) the minimization of avalanche related road closures;
- c) ensure that operational personnel working within a designated avalanche area have complete and current training in and awareness of snow avalanche response procedures including the following:
 - i) One Day Avalanche Safety Training;
 - ii) Search and Rescue Procedures;
 - iii) Explosive Spill Plan;
 - iv) Avalanche Personnel Check-in Procedures;
 - v) Mock Rescue Practice; and
 - vi) Familiarity of Avalanche Terrain within Service Area.

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 effective and efficient response and services in the event of a snow avalanche directly or indirectly effecting Highways, by supplying an adequate quantity and quality of equipment, and trained individuals;
- b) maintain and replace lost or stolen avalanche safety equipment supplied by the Ministry, unless otherwise specified in writing by the Province and as defined in the following:
 - i) Snow Avalanche Safety Measures for Highways Manual;
 - ii) Instructions on Weather Observations Manual; and
 - iii) Sign Manuals.
- c) comply with Highway maintenance restrictions as per the Five Level Avalanche forecasts and specific operational procedures, as provided by the local avalanche technicians;
- d) notify local Ministry avalanche personnel of any significant avalanche occurrences either above or on the Highway and report any changes in weather conditions associated with rising avalanche hazard conditions;
- e) ensure vehicle access to snow avalanche facilities, including but not limited to Gun Platforms, Rescue Caches and Explosive Magazines;
- f) ensure access to and relocate avalanche gates as required;
- g) remove avalanche Debris and snow from the Highway including Debris from any adjacent avalanche catchment areas and static avalanche defence structures;

- h) initiate as required and participate in snow avalanche search and rescue efforts to recover vehicles and/or Highway Users buried in a snow avalanche; and
- i) in the event of an avalanche, provide traffic control in accordance with the Maintenance Specification for *Highway Traffic Control*; and notify the Province and establish Highway closures as required to ensure the safety of Highway Users.

3.1.1 Performance Time Frames

The Contractor must:

- a) immediately, from the time an avalanche is detected by or reported to the Contractor, inform the Province and provide traffic control when required;
- b) respond to snow avalanche conditions within the maximum response times shown on the table below:

Condition	Maximum Response Time
(i) initiate Avalanche Search and Rescue Plan (as necessary), and prepare for and participate in search and rescue effort	immediately
(ii) provide access to avalanche gates and vehicle access to snow avalanche facilities	30 minutes, from the time notified by Ministry Snow Avalanche Technician
(iii) start clearing snow avalanche deposits from the Highway	immediately, on approval from the Ministry Snow Avalanche Technician
(iv) start with intent to completely remove clearing adjacent catchment areas and snow avalanche safety structures	within 24 hours, from time approval is obtained from the Ministry Snow Avalanche Technician

3.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3.3 Materials

The Contractor must supply materials and equipment necessary to support avalanche safety measures.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 7-800

STRUCTURE DAMAGE RESPONSE

1. OBJECTIVE

To ensure the safety of Highway Users, to restore all effected structures to their original condition, and to maximize their functional life.

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) repair Highway structures to a safe and stable condition in accordance with the specifications referred to in Section B of the Introduction;
- b) notify the Province where the safety of Highway Users is effected, so that the Bridge Structural Engineer may make an inspection;
- c) mobilize to brace and support the structure;
- d) respond immediately if the Bridge Structural Engineer determines that there is risk of structural failure under loading, by doing one of the following, as approved in writing by the Province:
 - i) restrict allowable loading on the Bridge;
 - ii) close the Bridge to all vehicular traffic; or

- iii) close the Bridge to all use;
- iv) construct a detour route of a maximum length of 3.5 km;
- e) reinforce all Fracture Critical members with temporary bracing or cables if the Bridge Structural Engineer determines that the structure is sufficiently safe to work on;
- f) close any structure with damaged Fracture Critical members to all traffic until repairs have been completed in accordance with the recommendations of the Bridge Structural Engineer;
- g) place temporary barrier or railing in accordance with the Maintenance Specification for *Bridge Railing Maintenance*, with no credit for such work under the Maintenance Specification for *Bridge Railing Maintenance*;
- h) complete and file a Chargeable Maintenance Costs report as applicable;
- i) take and forward photographs of the damage to the Province with the Chargeable Maintenance Costs report; and
- j) repair any damage to the structure in accordance with the applicable Maintenance Specifications, with no credit for such work under those Maintenance Specifications, unless mutually agreed to between the Province and the Contractor.

Note: Refer to Section H of the Introduction to these Maintenance Specifications.

3.1.1 Performance Time Frames

The Contractor must:

- a) immediately, from the time the damage was detected by or reported to the Contractor, notify the Province of any damage to any structure, so that the Bridge Structural Engineer may make an inspection;
- b) start installation of temporary barriers or railing placements within 24 hours, from the time the damage was detected by or reported to the Contractor; and

- c) perform all other required repairs in accordance with the applicable Maintenance Specification and their respective Performance Time Frames.

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

Refer to Section B of the Introduction to these Maintenance Specifications.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 7-810

BAILEY AND ACROW EMERGENCY INSTALLATION

1. OBJECTIVE

To replace any Bridge that has collapsed or has the potential to collapse.

2. GENERAL PERFORMANCE SPECIFICATIONS

2.1 Routine Maintenance Services

Not Applicable to this Maintenance Specification.

2.2 Quantified Maintenance Services

The Contractor must:

- a) maintain Ministry Bailey or Acrow emergency Bridge stockpiles;
and
- b) when an immediate traffic crossing is required on a Highway,
replace a Bridge which has collapsed or has the potential to
collapse.

3. DETAILED PERFORMANCE SPECIFICATIONS

3.1 Routine Maintenance Services

Not applicable to this Maintenance Specification.

3.1.1 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Quantified Maintenance Services

The Contractor:

- a) must install and dismantle each Bailey or Acrow structure, as
directed by the Province or in accordance with the manufacturer's
specifications;

- b) must store components of Bailey or Acrow emergency materials to ensure quick access and inspection;
- c) must ensure that incompatible components, such as those components supplied by Mabey & Johnson Ltd. (Compact Bailey), are not mixed in with other Bailey or Acrow materials;
- d) must identify any damaged components during the dismantling procedure by marking such components with fluorescent paint at the damaged section and setting these components aside for repair or disposal;
- e) must haul, load and unload material at the emergency site and return material to the stockpile site when the emergency replacement is required within the Service Area;
- f) must load and unload material at the stockpile site within the Service Area, for emergencies inside or outside the Service Area;
- g) must install timber decking in accordance with the Maintenance Specification for *Bridge Deck Maintenance*;
- h) must install steel decking, where it is supplied by the Province, in accordance with the Maintenance Specification for *Bridge Deck Maintenance*;
- i) will be entitled to a separate payment for each installation and dismantling of reinforced and non-reinforced Bailey or Acrow Bridge panel and all other associated components, including Launching Nose and metal Decking, loading and unloading at the Bridge site, or the stockpile site, for the particular structure indicated, in accordance with Part 2 of the Fee Schedule; and
- j) will be entitled to payment for supply of timber Deck materials required for emergency Bailey or Acrow Bridge maintenance in accordance with Part 2 of the Fee Schedule.

3.2.1 Performance Time Frames

The Contractor must:

- a) immediately, from the time the deficiency was detected by or reported to the Contractor, report to the Province any collapse or loss of any Bridge or structure, or any damage to a Bridge or structure which may require the installation of a Bailey or Acrow Bridge;
- b) immediately, upon approval by the Province, start installation of an emergency Bailey or Acrow Bridge and complete the work as soon as is reasonably possible; and
- c) schedule dismantling, as directed by the Province, and complete all dismantling and return emergency material to the stockpile site within a 1 month of receipt of such direction.

3.3 Materials

The Contractor must supply sufficient emergency timber Deck material to complete deck requirements, in accordance with the Maintenance Specification for *Bridge Deck Maintenance*, where emergency Bailey or Acrow stockpile resides within the Service Area.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 8-830

HIGHWAY INSPECTION

1. OBJECTIVE

To develop a comprehensive knowledge of Highway conditions to support a work identification and planning program; to identify deficiencies that require maintenance; and to identify conditions, not covered by these Maintenance Specifications, that could effect 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) inspect annually all Highways and components of the Highway system within the Service Area; and document results;
- b) conduct additional inspections in response to any condition reported by the public, regulatory agencies, police authorities and the Province, that is unsafe or has the potential to become unsafe; and
- c) *report to the Province any hazardous or deficient condition that is not covered by the Maintenance Agreement or this Maintenance Specification.*

3.1.1 Performance Time Frames

The Contractor must:

- a) inspect annually all Highways and components of the Highway and reflect findings in the work identification and planning program; and
- b) respond immediately to reports by the public, regulatory agencies, police authorities and the Province, of any condition that is unsafe or has the potential to become unsafe
- c) immediately report to the Province any hazardous or deficient condition that is not covered by the Maintenance Agreement or this Maintenance Specification. .

3.2 Quantified Maintenance Services

Not applicable to this Maintenance Specification.

3.1.2 Performance Time Frames

Not applicable to this Maintenance Specification.

3.2 Materials

Not applicable to this Maintenance Specification.

4. WARRANTY

Not applicable to this Maintenance Specification.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 8-840

HIGHWAY PATROL

1. OBJECTIVE

To identify conditions that are unsafe or have the potential to become unsafe; to identify conditions that could threaten the infrastructure; and attend to existing or changing conditions.

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) At all times other than identified in 3.1 b), c), d) and e), patrol all Highways in accordance with the frequencies established in 3.1.1 a) i) 1;
- b) during periods of high water flow, patrol all Highways in accordance with the frequencies established in 3.1.1 a) i) 2; give appropriate attention to areas known to be impacted first by high water flow;
- c) when freezing temperatures and/or snow fall are not present or forecast, patrol all Highways in accordance with the frequencies established in 3.1.1 a) ii) 1;
- d) during periods of snowfall, patrol all Highways in accordance with the frequencies established in 3.1.1 a) ii) 2;

- e) when temperatures are fluctuating between freezing and thawing, increase patrols to a frequency that will allow the Contractor to respond to changing conditions; and, give appropriate attention to areas known to be impacted first by weather events, as defined in section 3.1.1 a) of the Maintenance Specification for *Winter Abrasives and Chemical Snow and Ice Control*; and
- f) ensure patrol vehicles are prepared to deal with conditions when detected, by carrying Winter Abrasive or De-Icing Chemical. The Contractor may patrol using vehicles not equipped to apply chemical or abrasive if Highway surface conditions are bare and dry and if they can reasonably be expected to remain so. Under no circumstances will the contractor use vehicles not equipped to apply chemical or abrasive when precipitation is present, anticipated or forecast, or when freeze-thaw situations are present, anticipated or forecast, or when other Slippery conditions are present, anticipated or forecast.

3.1.1 Performance Time Frames

The Contractor must:

- a) complete patrols of Highways in accordance with the frequencies established in the tables below for each Highway Classification:
 - i) Summer Highway Classification

	1 & 2	3	4	5	6 & 7
1. at all times	24 h	2 d	7 d	14 d	21 d
2. during periods of high water flow □	2 h	4 h	8 h	16 h	32 h

Legend

h – hours

d – days

ii) Winter Highway Classification

	A	B	C	D	E
1. at all times	24 h	2 d	7 d	14 d	21 d
2. winter patrols (during snowfall)	4 h	8 h	16 h	24 h	36 h

Legend

h – hours

d – days

- b) report to the Province all rockfall onto the Travelled Lanes and Shoulder tops which have occurred during the previous month within 7 days of the end of each month using the Rockfall Report;
- c) take immediate and appropriate action during patrols to protect Highway Users from unsafe situations; and
- d) report to the Province immediately, upon detection or notification, any conditions which effect the Highway in performing its designed function but which are not specifically identified in these Maintenance Specifications.

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.

B.C. MINISTRY OF TRANSPORTATION

Maintenance Specification Chapter 8-850

BRIDGE AND STRUCTURE INSPECTION

1. OBJECTIVE

To develop a comprehensive knowledge of the condition of all Bridges, other structures and associated components to support a work identification and planning program; to identify deficiencies that require maintenance; and to identify conditions, not covered by these Maintenance Specifications, that could effect the Bridges, other structures and associated components.

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) inspect all Bridges, other structures and associated components within the Service Area; and document the results;
- b) conduct additional inspections of Bridges and other structures which have been effected by, but not limited to, impact from vehicles or their loads, vessels or their loads, flooding, Debris, water, high winds, vandalism, fire and/or excessive heat, earthquakes, excessive loading vibration and excessive settlement or movement of structure foundations;
- c) report to the Province any hazardous or deficient conditions that are not covered by the Maintenance Agreement or these Maintenance Specifications;

- d) monitor deficiencies and movement of structures and their components and notify the Province of any potentially hazardous or unsafe condition; and
- e) give special attention during inspections to Bridges with sub-standard load carrying capacity to ensure that existing capacities are maintained or improved; ensure load restrictions are signed on all Bridges with load restrictions.

3.1.1 Performance Time Frames

The Contractor must:

- a) inspect Bridges, other structures and associated components within the minimum frequencies established in the following table:

Structure Type	Summer Highway Classification			
	1 & 2	3	4 & 5	6 & 7
(i) Bailey and Acrow Bridges	14 d	21 d	2 m	3 m
(ii) timber Truss Bridges	21 d	1 m	1 m	1 m
(iii) log Stringer Bridges	n/a	3 m	6 m	1 y
(iv) other timber Bridges	2 m	3 m	6 m	1 y
(v) concrete and steel Bridges and other structures	4 m	6 m	1 y	1 y
(vi) Multiplate structures	6 m	1 y	1 y	1 y
(vii) Sign Bridges	1 y	1 y	1 y	1 y

Legend

d - days
m – months
y – years

- b) notwithstanding the above table, immediately, from the time the deficiency was detected by or reported to the Contractor, inspect a Bridge or structure with a safety or structural deficiency, and continue inspections at a frequency determined by the Bridge Structural Engineer;

- c) initiate, upon Commencement Date, an inspection of all Bridges, structures and associated components which is to be attended by representatives of the Province and the Contractor, on a schedule acceptable to the Province, and complete the inspection within 3 months; and
- d) operate backup power units, compressors, and other related equipment for a minimum of one hour each month, on a schedule acceptable to the Province.

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.

Highway and Structure Maintenance Definitions

In these Maintenance Specifications, unless the context otherwise requires, the following terms will have the following meanings ascribed to them:

ASTM	American Society for Testing and Materials.
Abutment	a wall supporting the end of a Bridge or Span and retaining the approach Fill.
Acrow	a proprietary name for a modular steel Panel Bridge similar to a Bailey Bridge.
Alligatored	an area of pavement identified by a checkerboard of cracks giving an alligator hide appearance that may or may not be accompanied by surface distortion.
Anchor Bolt	a Foundation bolt (including hardware), drift spike, or any other device used for holding any mechanism or structure down. It may or may not be threaded.
Armour	metal covering used at joints or around Piles, including rigidly affixed anchorages, to protect the underlying material.
Backfill	earth or other material used to replace material removed during construction, such as in culvert trenches, and behind Bridge Abutments and Retaining Walls. Also refers to material placed in Binwalls and between an old structure and a new lining.
Backslope	the slope at the opposite side of a Highway ditch from the Shoulder, and extending up to the natural ground level.
Bailey	a modular Bridge made of interchangeable latticed steel Panels coupled with pins. Used primarily as an emergency or temporary Bridge.
Ballast Wall	the section of an Abutment, above the Bridge Seats, that retains the adjacent Fill.

Bearing	<p>Superstructure support elements between the Bridge Seats and the Bridge Superstructure. Composed of steel, rubber, etc. separated into two general categories as follows:</p> <ul style="list-style-type: none"> (a) fixed allows only rotational movements. (b) expansion allows longitudinal as well as rotational movements. <p>Note: Refer to drawings for specific Bridges.</p>
Bent	a line of columns built as a structural unit, transverse to the Bridge and supporting the load of the Superstructure.
Black Ice	a very dangerous, Slippery condition on a pavement surface created by transparent ice on the dark asphalt, which is found at times in such locations as in shaded areas and is not normally noticeable in advance of driving onto Highway sections with such a condition.
Bleeding	an area where the asphalt mix is too rich, leading to the asphalt oozing to the surface in puddles and leaving a slick and slippery area.
Box Beam	concrete box Stringers which are precast for quick assembly at a Bridge site. When placed side by side these form the Deck as well and are often temporarily used as-is for a traffic Wearing Surface.
Braces	a diagonal, or sometimes horizontal, structural member used to stiffen a structure.
Bridge	a structure providing a means of transit for pedestrians and/or vehicles above the land and/or water surface of a valley, arroyo, gorge, river, stream, lake, canal, tidal inlet, gut or strait, above a Highway, railway or other obstruction, whether natural or artificial. The essential parts of a Bridge are: (1) the Substructure consisting of its Abutments and Pier or Piers supporting the Superstructure, (2) the Superstructure slab, girder, Truss, arch or other span or spans supporting the Highway loads and transferring them the Substructure, and (3) the Highway and its incidental parts functioning to receive and transmit traffic loads.
Bridge Joints	includes expansion joints, sealed joints, Finger Joints, Sliding Plate Joints and all other Deck joints.

Bridge Structural Engineer	a Civil Engineer registered with the Association of Professional Engineers of B.C., specializing in Bridge structural design, construction and maintenance and employed or retained by the Province for professional advice regarding structural matters.
Brow Log	a log placed above the Deck surface used as a Wheelguard. May act as an additional load-carrying Stringer if tied to the structure via Needle Beams.
CGSB	Canadian Government Specifications Board. CGSB specifications may be obtained from Canadian Government Specification Board, Ottawa, Ontario, K2A 0S5.
Camber	slight arch built into the longitudinal profile of a beam to accommodate deflections due to Dead Loads and Live Loads.
Cap	a horizontal member on an Abutment or Pier to distribute the loads of the Bridge. The Stringers or Bearings rest on the Cap.
Cementitious	having the properties of cement; essentially composed of cement.
Chord	the upper and lower longitudinal members of a Truss.
Class	see Classification.
Classification	designates the kinds and levels of Maintenance Services to be provided according to the amount and type of service the Highway is expected to provide, and for each individual Highway or portion of Highway is the Class which the Province's records designate, and as may be amended from time to time by the Province. The Minister may, at the sole discretion of the Minister, from time to time, change the Class of a Highway dependent upon other factors than indicated in this definition. Classifications of Highways in the Service Area are included in RIMS. The Summer Classification is generally based on, but not limited to, the following:

SUMMER CLASSIFICATION

<u>Class</u>	<u>A.D.T. (average daily traffic)</u> <u>Vehicles per Day</u>
1	over 10,000
2	5,000 - 10,000
3	1,000 - 5,000
4	500 - 1,000
5	100 - 500
6 *	10 - 100
7 *	0 - 10
8	a Highway, typically without a constructed road but for which maintenance responsibilities exist for such things as danger tree removal and drainage, and which may also have other improvements to maintain such as pedestrian and bicycle paths.

*Roads Classed 6 or 7 with heavy industrial use will be increased one Class in RIMS.

Winter Classification is generally based on but not limited to the following:

WINTER CLASSIFICATION

<u>Class</u>	<u>Definition</u>
A	high volume traffic (over 5,000 winter average daily traffic count) or commuter routes and certain expressways and Freeways through mountain passes, as determined by the Province. They are heavy commuter traffic routes extended to include the bulk of vehicles commuting daily to a center and cut-off where traffic drops below 2,500 <u>winter</u> average daily traffic count. Very high volume ski hill and commuter routes.
B	all trunk and main routes (or portion thereof as designated by the Province) not included in Class A, with a cut-off traffic volume of 1,000 winter average daily traffic count. Lower volume ski hill and commuter routes.
C	all school bus routes and industrial (truck) traffic routes (more than 25% trucks) not included in Class A and B.
D	all other regularly maintained winter routes.
E	all other irregularly maintained winter routes.
F	roads not maintained in the winter, or not open, or not maintained by the Minister.

Commencement Date	the first day of the Term, as described in the Maintenance Agreement.
Compacted	when an unloaded pick-up truck driven over the surface leaves an indentation of no more than 5mm.
Contract Year	has the same meaning as defined in Article I of the Maintenance Agreement.
Counter Brace	a Truss diagonal member inclined in the opposite direction to the Main Braces. Smaller than the Main Braces.
Crook	this is a deviation edgewise from a straight line drawn from end to end of a piece of lumber, whereas “twist” is a deviation flatwise including a curl, and “bow” is a deviation flatwise only.
Crown	this is the vertical rise in elevation from the outside edge to the centerline on straight sections of Highway, used to ensure run-off drainage.
Danger Tree	any tree deemed to be hazardous using a recognized assessment methodology such as that recognized by the Wildlife Tree Committee of British Columbia or the International Society of Arboriculture.
Debris	litter, rubbish, vegetation, fallen rocks, dead animals, spilled materials, brush, branches or other tree components or other items, which are not part of the Highway by intention.
Debris Dam	congested Debris obstructing the free movement of water in a stream.
Debris Flow	brush, trash, floating logjams, cable connected log fin booms, etc. all moving in a stream at high water. Sometimes collecting on Bridge Piers, dolphins, or Trash Racks.
Debris Torrent Structure	any structure which by design and/or function acts to control the flow of, or contain, Debris or Debris Flows, including but not limited to Debris impound basins, avalanche berms, avalanche deflector mounds, basins associated with snowsheds.
Deck	the portion of a Bridge that supports the Highway, from the top of the major structural members to the Wearing Surface, and designed to distribute loads evenly across the Bridge.
Decking	timber planking used as a Wearing Surface on the Deck of a timber Bridge.

De-Icing Chemical	material used to remove or assist the removal of ice and compacted snow from the pavement surface by chemical means.
Density	as defined in the Pavement Surface Condition Rating Manual.
Dirt and Gravel Highway	unpaved Highway, including the following components: the top surface of the Highway and the area between the outside edge of the top surface and the bottom of the ditch, known as the side slopes. Furthermore, the Dirt and Gravel Highway edge is the breakpoint between the extreme outside edge of the top surface and the side slopes.
Distortions	as defined in the Pavement Surface Condition Rating Manual.
Dragnet Vehicle Arresting Barrier	a device to bring errant vehicles to a safe controlled stop by absorbing the energy of the moving mass by way of a series of self contained units each containing spools of specially selected steel alloy tapes, or energy absorbers, and a series of special fabric nets or cables.
Drain	an aperture through a wall, curb, or Deck to provide egress for water that would otherwise accumulate on the Bridge.
Drifting	accumulation of snow caused by wind action close to the surface of the ground.
Ekki Wood	(Irophira procera) a tropical hardwood species used for timber Decking on Bridges.
Emergency Site	a geographically limited location where the damage is limited by the bounds of undisturbed road structure, including but not limited to: <ul style="list-style-type: none"> i) if a road parallels a stream that has eroded the road in several different locations, they will be considered different emergency “sites”; ii) if a road parallels a stream that has flooded at a location and the water has returned to the stream at another location(s), causing a washout(s) then this will be considered “one site”; iii) a stream paralleling a road and producing separated “floods and water returns” will be considered “different sites”;

- iv) a slide originating at one location and impacting on the road at one or more locations will be “one site”; and
- v) slides originating at different locations will be considered “different sites”.

A subsequent event causing damage to a previous site, that had been fully reconditioned to its original state, will generate a “new site”. An event or events that cause further damage to an existing site, not fully remedied and still within the response time of the pertinent specifications will be considered as an extension of the original site.

End Post	the last diagonal member at the end of a Truss, or the vertical member at the end of a Bailey or Acrow Bridge.
Fines	very small particles of material (under 200 micrometres in size), typically the size of fine silt or clay particles. Fines act as a binder or glue when intermixed with sand and gravel.
Finger Joint	an expansion Joint in which the opening is spanned by meshing steel fingers or teeth.
Flashing	sheet metal used as waterproofing or Armour for timber or log members.
Floor Beam	transverse members which support the Stringers and transmit the load to the main Girders or load carrying members. Steel Pier Caps on reinforced concrete Pier columns are a special type of Floor Beam.
Flume	an open channel or conduit of metal, concrete, or wood used to direct water away from a drain.
Flyover	a structure carrying one-way traffic over a Highway.
Footing	the portion of the Substructure resting on the ground.
Foundation	<ul style="list-style-type: none"> (i) the supporting soil material upon which the structural portion of the Bridge is placed. (ii) portions of the Bridge (usually below ground) which distribute the pressure to the soil or artificial supports. Similar to Footing.

Fracture Critical	any member for which failure is likely to result in the collapse of the structure.
Freeway	multi-lane Highway with fully controlled access.
Galvanized	steel or iron item which has a coating of zinc applied for rust protection.
Geotechnical Engineer	a Geological Engineer registered with the Association of Professional Engineers of B.C., and employed or retained by the Province for professional advice regarding geotechnical matters.
Gradation	the distribution of size of material particles from coarse to very fine, determined by quantities retained on screens of decreasing mesh size or spacing.
Grading	the machine blading of dirt or gravel Highway surfaces to remove Raveling and Rutting and establish proper cross-section.
Grout	a fluid mixture of cement, sand, and water that can be poured or pumped easily.
Guardrail	barrier fastened to the edge of a Bridge Deck to prevent vehicles from running over the side of the Bridge.
Gusset	a plate serving to connect the elements of a member or the members of a structure and to hold them in the correct alignment and/or position at a joint.
Hard Surfaced Highways	all Highways which do not have a dirt or gravel surface.
Heart-Side	the face of a timber that was closest to the centre of the tree. Growth rings are concave on the Heart-Side.
Heartwood	timber members that contain the center annual rings of the original tree, or the soft central core.
Highway	has the meaning ascribed to it in the Maintenance Agreement.
Highway User	any person or persons, regardless of form of transportation, that use any lands or facilities within the jurisdiction of the Ministry of Transportation.

Hot-in-place Patch	a Permanent Patch using existing asphalt and re-cycling and re-applying it at the same location.
Laminated	transverse members of a laminated Bridge Deck having the same function as Cross-Ties. Usually preservative treated two-inch nominal sized lumber tightly placed perpendicular to the traffic direction and vertically on edge over the Stringers, then nailed to the Stringers and each other. May also be parallel to the traffic (longitudinally laminated).
Lateral Rod	a horizontal, transverse tension rod.
Launching Nose	this is a length of Bailey or Acrow Bridge structure which is used to help launch the Bridge. The Launching Nose is raised from the normal horizontal position by pinning, allowing it to make contact with a Roller at the other end of a Span to continue the launching process. Once the structure is fully in position the Launching Nose is removed.
Livestock	as defined in the <u>Livestock Act</u> .
Longitudinal Cracking	includes Longitudinal Wheel Path Cracking and Longitudinal Joint Cracking as defined in the Pavement Surface Condition Rating Manual.
Lower Mainland	the area to the south of a straight line from Horseshoe Bay east to Hope and then proceeding due south to the Canada-USA border and then proceeding west along the Canada-USA border to the Strait of Georgia.
Main Brace	a primary diagonal member in a Truss.
Maintenance Services	the same meaning as described in Article I of the Maintenance Agreement.
Maintenance Specification	the Maintenance Specification of the Province for the particular maintenance activity described in this Maintenance Specifications Manual.
Median	the portion of a divided Highway separating the traveled ways for traffic in opposing directions.
Multiplate	a steel culvert, three metres or more in diameter, fully or partially factory assembled or field assembled by bolting together a number of

	corrugated steel plates. When less than three metres in diameter it will be considered to be a culvert.
Needle Beam	a transverse log, timber, or steel beam placed under the Stringers and fastened to them to make them act as a unit. Used to join the Stringers and trussing system.
Number 1	lumber grading in accordance with the National Lumber Grades Authorities Standard Grading Rules for Canadian Lumber.
Number 2	lumber grading in accordance with the National Lumber Grades Authorities Standard Grading Rules for Canadian Lumber.
Off-take	the extension of ditches away from the line of the Highway and toward the Right-of-way boundary or low ground for the purpose of de-watering a Highway Road Base or eliminating excessive Roadside water flow and erosion.
One Hundred Year Flood	a term describing the stream or river's maximum expected peak flow within a period of 100 years, computed from hydrological data, watershed information and historical annual peak flow data.
Overhead	a Bridge carrying a Highway over a railway, or a railway and another facility.
Overlay Patch	a Permanent Patch that consists of a layer of new asphalt over an existing asphaltic pavement, or a new layer of asphalt or concrete on a Bridge deck.
Overpass	a grade separated structure where the Highway passes over an intersecting Highway or railway.
Panel	the main load carrying member in a Bailey or Acrow Bridge structure. Panels are pinned together end to end and connected side by side where necessary to form continuous Girder Trusses from bank to bank. A traffic surface Deck is mounted between the bottom Chords of the Panels.
Parapet	a wall-like member of reinforced concrete integrally connected to the sidewalk portion of a Bridge to serve as a protective barrier for vehicular or pedestrian traffic.
Pedestrian Overpass	a Bridge carrying pedestrians over a Highway.

Permanent patch	a patch that lasts as long as the adjacent surface.
Pickets	a vertical element used to mark Highway features.
Pier	an intermediate vertical support (Substructure) used to join and support the two Spans.
Pile	a structural column driven deep into the ground (at least two metres) to provide support for structures built on soft ground. Piles are used for Abutments and Piers and for protective dolphins and retaining walls.
Piling	a structure or group of Piles.
Pin	a cylindrical bar used as a means of connecting, holding in position, and transmitting the stresses of the members forming a Truss or framed joint.
Ponding	large puddles of water trapped on the Highway surface.
Portal	the clear unobstructed space of a through Bridge forming the entrance to the Bridge. The entire Portal member of the top Chord bracing which fixes the uppermost limit of the vertical clearance.
Pot-hole	on a paved or Sealed Highway, an area where a piece of pavement has broken free and been removed, leaving a hole, usually the depth of the asphalt pavement layer and on a gravel Highway, a hole in which water puddles.
Pull-outs	these are widened areas alongside Shoulders of the Highway, where vehicles may pull off the traveled surface. Usually a site where a litter receptacle is located and may include an historical marker, picnic tables or other features.
Quantified Maintenance Services	one of the maintenance Services, as defined in Article I of the Maintenance Agreement and in the introduction to these Maintenance Specifications.
Railway Authority	a company which, under the <u>Railway Act</u> , has control of and is responsible for the rail portion of a Railway Crossing.
Railway Crossing	Highway surface common to both the Railway Authority and the Province bounded by a length equal to the length from end of tie to end of tie and a width equal to the Highway width from Shoulder point to Shoulder point plus one-half metre each side.

Railway Crossing Approach	the Highway prism including ditches on the Railway Authority's property from the Railway Crossing outward to the edge of the Railway Authority's Right-of-way.
Rakers	these members, in Bailey and Acrow Bridges structures, are the stabilizers that connect between Transoms and the top hole in a Panel vertical section.
Ravelling	on a paved Highway, an area where the asphalt mix is too lean, leading to the aggregate popping out of the mix or breaking away under wear and on a gravel Highway, where the coarse aggregate is loose and there are not enough Fines to allow compaction to a tight surface.
Re-decking	the replacement of a Bridge Wearing Surface. On timber structures this includes: planking, Wheelguards and shims, rail posts, post braces and railing, and may include cross ties. Minor Re-decking involves no replacement of cross-ties; Major Re-decking involves the replacement of cross-ties.
Refurbish	for the purposes of the Maintenance Specification for Sign System Maintenance only, it means the removal of the Sign from the field to a Sign shop, stripped of the old Sign face by a chemical or grinding process, and an addition of a new face to the Sign blank. Sign overlaying done at the Sign shop is also considered as being Refurbished.
Reinforcing Steel	steel bars embedded in concrete structures during forming and manufacture. These bars add tension strength to concrete and resist contraction or expansion due to temperature change.
Replacement Patch	a Permanent Patch consisting of new asphalt in place of the existing asphaltic pavement or concrete on a Bridge .
Re-shaping	the machine blading of Dirt and Gravel Highways from ditch line to ditch line, to re-establish the proper shape of the Highway including Shoulder edges and Crown. This process also brings aggregate and Fines back onto the surface from Shoulders and ditches and involves a deeper cut than Grading.

Rest Area	<p>a safety Rest Area is a developed Roadside area for the use of the traveling public, containing washrooms, litter receptacles and other facilities as follows:</p> <ul style="list-style-type: none"> a) Class "A" a major full service facility, containing a large, permanent building with sinks, usually with 9 or more flush or composting toilets, power, and illumination of pedestrian and/or parking facilities. These sites may also contain a tourist information facility operated by others. b) Class "B" a moderate sized facility containing a permanent building, usually with 4 or more flush or composting toilets c) Class "C" a small facility containing one or more one-person structures with pit or chemical toilet facilities.
Retaining Structure	a vertical structure designed to resist the horizontal earth pressures of a Fill or other material and/or a structure designed to prevent material from spilling onto the Highway.
Right-of-way	the legally defined property on which the Highway is situated.
Rip-rap	protective cover of large stone, rock or concrete of various sizes placed compactly or irregularly to prevent and protect stream banks, sides of fills around Abutments or Piers, the Travelled Lanes and other Highway features from Scour, Debris and erosion.
Road Base	the portion of Highway subsurface on which the traveling surface or wearing surface is placed.
Roadside	that part of the public Highway between the edge of Shoulder and the Highway Right-of-way boundary, including the sidewalk. It does not include the Shoulder.
Routine	one of the Maintenance Services, as defined in Article 1 of the Maintenance Agreement and in the Introduction to these Maintenance Specifications.
Rural	all areas outside Urban boundaries.
Rutting	deformation of the surface of the road in the vehicle wheelpath due to repetitive passes of vehicle tires.
S4S	a timber surfacing designation meaning Surfaced Four Sides.

Sapwood	outer layers of growth of a tree between the bark and the Heartwood which contains the sap.
Schedule 1	<p>as defined by section 19.07 of the <u>Motor Vehicle Act Regulations</u>, designating those Highways which cannot be used by the following:</p> <ul style="list-style-type: none"> a) vehicles drawn by animals; b) livestock, as defined in the <u>Livestock Act</u>; c) farm implements and farm machinery, whether self-propelled or towed; d) pedestrians, unless attending a disabled vehicle; e) vehicles incapable of maintaining a minimum speed of 60 km/h on level Highway, except construction or maintenance equipment while working on or traveling to or from a worksite located on a Highway named in Schedule 1.
Schedule 2	as defined by section 19.08 of the <u>Motor Vehicle Act Regulations</u> , designating those Highways where fencing will be erected if livestock are at large on the adjacent land.
Scour	<p>the local lowering of the streambed by the erosive action of water.</p> <ul style="list-style-type: none"> (i) general Scour occurs in a waterway opening as a result of obstruction of the flow. (ii) local Scour occurs at a Pier or Abutment as a result of local obstruction of the flow. (iii) natural Scour is the Scour of a streambed resulting from natural phenomena, such as channel meandering.
Sealed	<p>a gravel Highway surface on which emulsified oil and aggregate has been alternatively spread, including compaction for particle set, building up an asphaltic pavement layer.</p> <p>or/ a paved Highway surface on which asphaltic products have been used to seal cracks, extend life expectancy of the paved Highway and create a skid resistant surface.</p>

Services	as defined in Article I of the Maintenance Agreement and the introduction to these Maintenance Specifications including: Routine Maintenance Services, Quantified Maintenance Services, Emergency Services and Additional Maintenance Services
Severity	as defined in the Pavement Surface Condition Rating Manual.
Shadow Vehicle	a vehicle used as a mobile advance warning device, as described in the "Traffic Control Manual for Work on Roadways".
Shim	to support, level, or adjust the fit by using thin, often tapered pieces of material.
Shoulder	the area between the edge of the outside traffic lane and the ditch, including the following components: Shoulder top, Shoulder edge, and Shoulder side slope. Furthermore, the Shoulder edge is the breakpoint between the Shoulder top and the Shoulder side slope.
Shoving	a longitudinal displacement of a localized area of a pavement surface, generally caused by braking or accelerating vehicles and usually located on hills and at intersections.
Sight Distance	<p>driver visibility of the Highway, Signs and intersections at minimum distance to safely drive the Highway at these locations.</p> <p>a) for the purposes of removing all movable obstructions (i.e. brush, tall grass, vehicles, etc.) from the Highway Right-of-way, the following minimum Sight Distances will be met:</p> <p>(i) for vehicles traveling on any traveled portion of a Highway:</p>

<u>Summer Highway Classification</u>	<u>Minimum Highway Sight Distance</u>
1, 2, 3	330 m
4 & 5	200 m
6 & 7	75 m

- (ii) for vehicles stopped at an intersection a distance of 2 metres behind the applicable legal stopping location for the highway at that point and intersection, visibility in both directions to the traveled portion of the Highway will be:

<u>Summer Highway Classification</u>	<u>Minimum Highway Sight Distance</u>
1, 2, 3	300 m
4 & 5	200 m
6 & 7	100 m

- (iii) for vehicles on the traveled portion of the Highway the minimum Sight Distance to Highway signs will be:

<u>Summer Highway Classification</u>	<u>Minimum Highway Sight Distance</u>
1	500 m
2 & 3	300 m
4 & 5	150 m
6 & 7	75 m

- b) Sight Distance for traffic control requirements will be defined as the length of unobstructed Highway visible to the driver and the following values (as a function of the posted speed limit) will be the minimum distances acceptable to the Province. Sight Distance less than set out below will require additional control as defined in the Sign Manuals:

50 kilometres per hour	80 metres
60 kilometres per hour	110 metres
70 kilometres per hour	130 metres
80 kilometres per hour	170 metres
90 kilometres per hour	200 metres
100 kilometres per hour	250 metres
110 kilometres per hour	300 metres

Sign	a lettered board, message or other display which includes all regulatory, warning, guide or informational, advisory, construction and maintenance, route markers and all special or other messages/displays under the Provincial jurisdiction as defined by the Province but excluding electronically controlled messages/displays; a sign includes the Sign Face Overlay.
Sign Bridge	an overhead sign support structure, typically of truss construction, with the horizontal member either supported at both ends or cantilevered over the Traveled Lanes. Type L, M, or H galvanized post davits are not considered to be Sign Bridges.
Sign Face Overlay	the layer of the Sign which contains the message, and which is applied to the aluminum, wood or steel sign.
Sign System	includes all regulatory, warning, guide or informational, advisory, construction and maintenance, route marker Signs, Sign Bridges, avalanche gates, delineators, hazard markers, Signs, Sign Face Overlay, posts, hardware (i.e. nuts, bolts, washers, rivets, etc.) and all special Signs, under other Provincial jurisdictions, as defined by the Province but excluding electronically controlled signage.
Sill	horizontal structural member set directly on the ground surface, or embedded only to a firm surface level. Usually a temporary base for a temporary support (see False Bent) or bracing.
Sliding Plate Joint	an expansion Joint in which the opening is covered by a steel plate attached to only one side of the joint.
Slippery	any road condition which causes an increase in normal dry surface stopping distances as a result of buildup of frost, ice, slush or snow.
Slope Of Grain	the deviation of the line of fibres in a timber member from a straight line parallel to the sides of the piece.
Slump	a measure of the workability and flowability of concrete. Slump varies with water, air, and admixture content and the temperature of the concrete.
Snow Avalanche Technician	a snow avalanche technician designated by the Province as such.

Snow Berm	a windrow of snow constructed for the purpose of accumulating Drifting snow.
Sod	a mat of grass roots and fibres containing earth and granular aggregate.
Spall	circular or oval depression in concrete resulting from separation of a portion of the surface, at a fracture. Usually part of the rim is perpendicular to the surface.
Specialty Fences	all fences other than those installed on Schedule 1 or Schedule 2 Highways for which the Province is responsible, e.g., fences in Rest Areas, at bridge ends, etc.
Split	a through longitudinal separation of the wood cells at the end of a piece of lumber.
Spray Patch	a Permanent Patch that consists of a layer of asphalt, covered with aggregate over existing asphaltic pavement.
SSPC	Steel Structures Painting Council. A society concerned with the use of coatings to protect industrial steel structures.
Stringer	longitudinal beams supporting the Bridge Deck, and in large Bridges or Trusses, framed into or upon the Floor Beams.
Substructure	Abutments, Piers, their Foundations and protective works which form the Bridge Substructure supporting the Superstructure above.
Summer Highway Classification	see Classification.
Superelevation	this is the vertical rise in elevation from the outside edge of a Highway surface, to the inside edge on a curving section of Highway.
Superstructure	the entire structure of a Bridge resting on the Piers and Abutments, consisting of Stringers, Decking, Trusses, sidewalks, Wearing Surface and railing.

Sway Brace	<ul style="list-style-type: none"> (i) a piece bolted or otherwise secured in an inclined position upon the side of a Pile or frame Bent between the Cap and Sills to add rigidity to the assemblage. (ii) a component of Bailey or Acrow Bridges, used to square each bay of the Bridge and prevent sway movements of the Bridge.
Temporary Patch	a temporary correction of pavement deficiencies to address safety issues.
Transom Clamps	these are vise-type clamps with a swinging bolt at one end, used on Bailey and Acrow Bridge structures to hold the Transom securely to the bottom Chord of Panels.
Transoms	the Deck supporting cross member in a Bailey or Acrow Bridge structure, spanning between the bottom Chords of the Panels in these Bridges.
Transverse Cracking	as defined in the Pavement Surface Condition Rating Manual.
Trash Rack	a pervious barrier constructed to catch Debris and prevent blockage of a Bridge or the inlet of a culvert or Multiplate.
Travelled Lane	<p>the surface of a Highway:</p> <ul style="list-style-type: none"> (i) between the painted shoulder line on one side and the painted Shoulder line on the other side, or (ii) in the absence of Shoulder lines - from asphalt edge to asphalt edge, or (iii) in the absence of hard surfacing refer to the definition of Dirt and Gravel Highway. <p>The travelling portions of Rest Areas, pullout areas, parking areas, Weigh Scale Areas, and any other vehicle-accessible portions within the Right-of-way are included.</p>
Treated	a gravel Highway surface on which emulsified asphalt and aggregate has been alternatively spread, including compaction for particle set, building up an asphaltic pavement layer.

Truss	a jointed Bridge structure having an open built web construction so arranged that the frame is divided into a series of triangular figures with its component straight members primarily stressed axially only.
Truss Rod	a vertical Tension Rod.
Underpass	a Bridge carrying a Highway beneath another feature including a Highway of less traffic volume.
Urban	within a Municipality as the term is defined in the <u>Local Government Act</u> , or within a distance of 3 kilometres of a municipal boundary, or extending out to the limit of residential or commercial development, whichever comes first.
Wane	bark or lack of wood from any cause, except eased edges, on the edge or corner of a piece of lumber.
Wash-boarding	transverse ridges, ripples or small bumps on a gravel/dirt Highway surface (right angles to travel), usually on hills or steeper sections, leading to very rough, vibrating or chattering ride.
Water/Cement Ratio	the mass ratio of the water to the cement contained in a unit volume of concrete. Usually between 0.40 and 0.45 for normal concrete.
Wearing Surface	the surface portion of a Bridge Deck directly in contact with the wheels of vehicles.
Weigh-in-motion Sites	a facility that uses sensors in the pavement for weighing vehicles while they are in motion.
Weigh Scale Area	a facility within Highway Right-of-way which may be used by the Province for the purpose of commercial vehicle weighing, including but not limited to the traveling and parking areas, buildings and scale, signing and signals.
Wheelguard	a steel or timber piece placed longitudinally along the side of the Highway to guide the movements of vehicle wheels and safeguard the Bridge Trusses, railings and other constrictions existing outside the Highway from collision with the vehicles and their loads.
Wildlife	as defined in the <u>Wildlife Act</u> .

Winter Abrasive	the sand or fine gravel applied to Highway surfaces during winter snow and ice conditions to provide traction for vehicles. May or may not contain De-Icing Chemicals.
Winter Highway Classification	see Classification.

QUANTIFIED MAINTENANCE SERVICES

LIST OF ACTIVITIES

Maintenance Specification	Quantified Maintenance Services	Activity Number	Contract Year Quantity	Unit of Measure
Pavement Patching and Crack Sealing	Overlay Patch (isolated)	100J	xxx	m2
	Replacement Patch (isolated)	100K	xxx	m2
	Hot-in-place Patch	100L	xxx	m2
	Overlay Patch	100M	xxx	m2
	Replacement Patch	100N	xxx	m2
	Spray Patch	100P	xxx	m2
	Spray Patch (isolated)	100Q	xxx	m2
	crack sealing	100R	xxx	lin m
Highway Surface Treatment	surface treatment	110M	xxx	m2
	surface treatment (isolated)	110N	xxx	m2
Gravel Surface Grading and Re-shaping	gravel surface Grading (Re-shape)	130P	xxx	rd km
	gravel surface Grading	130Q	xxx	rd km
Dust Control and Base Stabilization	base sabilization	140M	xxx	rd km
	dust control (initial yearly application)	140P	xxx	rd km
Highway Surface and Shoulder Gravelling	gravelling - crush (isolated)	150K	xxx	m3
	gravelling - pit run (isolated)	150L	xxx	m3
	gravelling - crush	150M	xxx	m3
	graveling - pit run	150N	xxx	m3
	Shoulder gravelling (isolated)	150P	xxx	m3
	Shoulder gravelling	150R	xxx	m3
Highway Shoulder Maintenance	Shoulder Grading	160P	xxx	sh km
Road Base Maintenance	road base repair	170P	xxx	m3
Curb, Island and Barrier Maintenance	roadside concrete barriers	220M	xxx	ea
	Median concrete barriers	220N	xxx	ea
	machine-laid asphalt curb	220P	xxx	lin m
	machine-laid concrete curb	220R	xxx	lin m
Ditch and Watercourse Maintenance	ditch construction (new)			
		250M	xxx	lin m
	ditch maintenance (machine)	250P	xxx	lin m
Drainage Appliance Maintenance	grader ditching	250Q	xxx	lin m
	catch basin (metal)	260K	xxx	ea
	catch basin (concrete)	260L	xxx	ea
	culvert/Flume install (to 400mm)	260M	xxx	lin m
	culvert/Flume install (401mm to 600mm)	260N	xxx	lin m
	culvert/Flume install (601mm to 1200mm)	260P	xxx	lin m
	culvert/Flume install (1201mm to 3000mm)	260R	xxx	lin m

QUANTIFIED MAINTENANCE SERVICES

LIST OF ACTIVITIES

Maintenance Specification	Quantified Maintenance Services	Activity Number	Contract Year Quantity	Unit of Measure
Shore, Bank and Watercourse Maintenance	Rip-rap install (> 50kg size)	270M	xxx	m3
Roadside Vegetation Control	mowing (machine)	350K	xxx	ssk
	mowing (hand cutting)	350L	xxx	m2
	brushing (machine)	350M	xxx	ssk
	brushing (hand cutting)	350N	xxx	m2
	Danger Tree removal	350P	xxx	ea
	overhead brushing	350R	xxx	sh km
Roadside Fence Maintenance	chain link (Schedule 1 & 2)	400P	xxx	lin m
	barbed wire (Schedule 1 & 2)	400Q	xxx	lin m
	page wire (Schedule 1 & 2)	400R	xxx	lin m
Sign System Maintenance	delineators	440K	xxx	ea
	Sign System install (2 post > 3.2 m2)	440L	xxx	ea
	Sign System install (1 post)	440M	xxx	ea
	Sign System install (2 post < 3.2 m2)	440N	xxx	ea
	Sign (to 1 m2)	440P	xxx	ea
	Sign (1 m2 to 3.2 m2)	440Q	xxx	ea
	Sign (> 3.2 m2)	440R	xxx	ea
	Sign Face Overlay (to 1 m2)	445P	xxx	ea
	Sign Face Overlay (1 m2 to 3.2 m2)	445Q	xxx	ea
	Sign Face Overlay (> 3.2 m2)	445R	xxx	ea
Bridge Deck Maintenance	timber Re-decking (Minor)	500M	xxx	m2
	timber Re-decking (Major)	500N	xxx	m2
	linseed oil/mineral spirit treatment	500O	xxx	m2
	concrete Deck repair	500P	xxx	m2
	timber Deck replacement	500Q	xxx	m2
	concrete Deck crack sealing	500R	xxx	lin m
Bridge Joint Maintenance	Bridge Joint Armour replacement	530M	xxx	lin m
	Bridge Joint seal replacement	530P	xxx	cm2
Minor Painting of Bridge Structures	steel surface painting	570P	xxx	m2
	steel rail painting	570Q	xxx	lin m
	timber rail painting	570R	xxx	lin m
Concrete Structure Maintenance	concrete repair	600P	xxx	m2
	epoxy injection	600Q	xxx	cm3
Timber Truss Bridge Maintenance	timber Truss member replacement	620P	xxx	ea
	timber Truss Rods (drop/replace)	620Q	xxx	ea
Timber and Log Structure Maintenance	timber Stringer replacement	650P	xxx	ea
	log replacement (stringer/brow log/needle beam)	650Q	xxx	ea
	timber Cap replacement	650R	xxx	ea

QUANTIFIED MAINTENANCE SERVICES

LIST OF ACTIVITIES

Maintenance Specification	Quantified Maintenance Services	Activity Number	Contract Year Quantity	Unit of Measure
Retaining Structure Maintenance	Retaining Structure component replacement	660P	xxx	m2
Provisional Sum			\$xxx	PS
Roadside Fence Maintenance	Specialty Fences	400M		
Bridge Bearing Maintenance	Bridge Bearing replacement	540P		
Bridge Piling Maintenance	Bridge Pile replacement	640M		