

**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:

	<b>Summer Highway Classification</b>				
	<b>1&amp;2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6&amp;7</b>
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:

<b>Summer Highway Classification</b>				
<b>1&amp;2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6&amp;7</b>
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):

<b>Summer Highway Classification</b>		
<b>1&amp;2</b>	<b>3</b>	<b>4,5,6&amp;7</b>
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.