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## **401.0 OPERATIONS AND MAINTENANCE**

## **401.1 INTRODUCTION**

### **401.1.1 Specification Format**

A standardized format has been adopted for the specifications set out in this Section:

- a) Objective
- b) Performance Measures
- c) Specific Requirements – mandatory items of work that are required to be delivered or are an exception to a stated service.
- d) Notes – supplementary information and cross-references to applicable specifications and Reference Documents.

### **401.1.2 Application of Specifications**

Whenever more than one specification or more than one part of a specification applies to a particular Bypass Infrastructure location, condition, circumstance or activity, Project Co shall comply with each and every applicable specification or part thereof.

Where work is noted in the specific requirements to be in accordance with a particular specification, this is recognised as being one method available to achieve the requirements of this specification. It does not imply the only possibility or remove any responsibility of Project Co to achieve the output requirements.

## **401.2 SCOPE**

This Section defines the required condition and response times related to the provision of the operation, the maintenance and associated reporting requirements. The requirements set out in this Section reflect the minimum expectations of users of the Bypass Infrastructure on day-to-day standards and response time performance criteria. Operational Performance Measures include either or both condition measures and response measures.

## **401.3 KEY PERFORMANCE MEASURES**

### **401.3.1 General**

Project Co is required to develop and implement a performance reporting system acceptable to the Ministry that will provide the information to enable review of Project Co's performance in terms of the full suite of measures described in the contract documentation. This database system shall be able to store monthly data relating to the measures at a level that enables calculation of monthly, year to date and contract to date measures.

Data to populate the system will come from the Ministry's monthly auditing of Project Co, operational records and internal audits incorporated within Project Co's IMS Documentation. It

is expected that data fields within the reporting system would include as a minimum, details on the audits performed, targets and results for each Key Performance Measures (“KPM”) category and individual measures.

The development of the performance reporting system is subject to review by the Ministry within the Operational Term, and Project Co shall make changes within the overall performance of the contract. Provision and management of the performance reporting system shall be included within the system as well.

### 401.3.2 Key Performance Measures

Key Performance Measures provide the ability to monitor higher level trends Project Co’s operation and maintenance performance. Selected KPMs have been grouped under the following key delivery areas:

- a) Operational communications;
- b) Safety;
- c) Asset service;
- d) Winter service;
- e) Corridor management;
- f) Emergency response; and
- g) Project relationships.

Project Co is required to compile the results of KPMs detailed in Table 401-1 and report monthly achievement.

The individual Performance Measures selected for the KPMs include both condition measures and response measures for the operation and maintenance activities. Table 401-1 identifies the minimum required KPMs for the operation and maintenance.

**Table 401- 1: Key Performance Measures (KPMs)**

Delivery Areas	Key Performance Measures (KPMs)	Measure Reference (OPM)	Weighting %
a) Operational Communications	1. Highway Condition Reports	PO5.1.2c	15
	2. Report adverse or extreme road surface conditions	PO5.1.2d	
	3. Recording of Lane Closure Events	PO5.1.2g	
	4. Customer Satisfaction Rating	PO5.4.2a	
	5. Respond to correspondence	PO5.4.2d	
b) Safety	6. Surface Maintenance – Removal of Debris	PO6.4.2b	20

Delivery Areas	Key Performance Measures (KPMs)	Measure Reference (OPM)	Weighting %
	7. Line Marking Maintenance – minimum retro-reflectivity	PO10.3.2b	
	8. Structure Maintenance - Temporary repair of Decks	PO11.2.2a	
	9. Safety Management – Remedy hazards	PO15.1.2f	
c) Asset Service	10. Surface Maintenance - Correct pavement deficiency	PO6.1.2d	20
	11. Bridge and Structure Maintenance - Repair, clean and restore	PO11.1.2a	
d) Winter Service	12. Highway Snow Removal- accumulations	PO8.1.2b	15
	13. Winter Abrasive and Chemical Snow and Ice Control– deploy resources	PO8.2.2a	
	14. Winter Abrasive and Chemical Snow and Ice Control– Restore traction	PO8.2.2c	
e) Corridor Management	15. Highway Inspections – respond to reports	PO13.1.2b	15
	16. Highway Patrols	PO13.2.2a	
	17. Corridor appearance – Litter	PO9.2.2a	
f) Emergency Response	18. Implement Traffic Control	PO12.2.2e	10
	19. Flood Control and Washout Response	PO12.4.2f	
	20. Mud and Earth Slide Response - Repair damage	PO12.5.2g	
	21. Structure Damage Response	PO12.6.2c	
	22. Incident Response	PO12.3.2i	
g) Project Relationships	23. Project Integration	PO5.3.2a	5
	24. Project Representation	PO5.3.2b	
			100

- Notes: (a) The individual KPMs in each delivery area are to have the same weighting.  
 (b) In general each KPM will be measured in the form of [Number of complying events/ Number of events occurring in the month].  
 E.g. Safety Management – Remedy hazards = [Number of Safety hazards remedied/ Number of Safety hazards identified in the month]

## 401.4 DOCUMENTATION REQUIREMENTS

### 401.4.1 Objective

The provision of reports and records to the Ministry is an essential requirement of this Project Agreement to ensure that the Ministry can continue to perform its appointed governance duties, and to enable the Ministry to provide for future needs of the Bypass Infrastructure and road users.

### 401.4.2 Plans and Reports

Table 401-2 summarizes the plans and reporting requirements, including deliverables and due dates, set out in this Section.

**Table 401- 2: Schedule of Plans, Reports, and Data (Response Time Measures)**

Performance Measure	Deliverable Name	Specification Reference	Due Date	Review Procedure
PO4.1a	Operation and Maintenance Plan (First Submission)	401.4.3	Submitted 60 days prior to OM&R Commencement Date	Yes
PO4.1b	Operation and Maintenance Plan (Updates)	401.4.3	June 1 annually	Yes
PO4.1c	OM&R Monthly Reports	401.4.4	By tenth of each month	Yes
PO4.1d	Traffic Count Data	401.4.5	By tenth of each month	Yes
PO4.1e	Asset Inventory Data	401.4.6	December 30 annually	Yes
PO4.1f	Network Status Videos	401.4.7	Each 5 years anniversary of Effective Date, plus within one month of end of Project Term or Termination Date	Yes
PO4.1g	Highway Condition Reports	401.5.1	As per Section 5.1 of this Section	N/A
PO4.1h	Customer Care Plan	401.5.4	June 1 annually	Yes
PO4.1i	Customer Satisfaction Survey	401.5.4	June 1 of each year	Yes
PO4.1j	Salt Management Plan	401.8.4	June 1 annually	Yes



Performance Measure	Deliverable Name	Specification Reference	Due Date	Review Procedure
<b>PO4.1k</b>	Salt Usage Report	401.8.5	June 1 of each year or as otherwise specified	Yes
<b>PO4.1l</b>	Emergency Response Plan	401.12.1	June 1 of year 1	Yes
			Reissue when amendments are made	Yes
<b>PO4.1m</b>	Staff contact information	401.12.1	March 31 annually	N/A
<b>PO4.1n</b>	Incident Reports	401.12.2	As required	N/A
<b>PO4.1o</b>	Safety Management and Intervention Plan	401.15.1	June 1 of year 1, reissue when amendments are made	Yes

*N/A- Non- applicable*

The documents above that are indicated to be subjected to the Review Procedure shall be submitted by Project Co to the Ministry in accordance with Schedule 9 - Review Procedure.

### **401.4.3 Operation and Maintenance Plan**

The objective of the Operation and Maintenance Plan (the “**Operation and Maintenance Plan**” or “**OMP**”) is to provide the Ministry with a plan that demonstrates contract compliance with respect to performance obligations. It should clearly describe Project Co’s understanding and detailed approach to delivering all aspects of the operation and the maintenance for the entire Bypass Infrastructure relative to the specified Performance Measures.

Overall responsibility of the OMP resides with Project Co and it is critical that its production be coordinated with all parties engaged by Project Co to deliver the operation and the maintenance. The OMP must ensure that it encompasses the complete scope of the operation and the maintenance requirements to be delivered by Project Co under this Project Agreement. Project Co shall deliver an Operation and Maintenance Plan which includes as a minimum processes and procedures to:

- a) Ensure compliance with the Technical Requirements and all other requirements of this Agreement, including the OM&R Requirements;
- b) Prepare and deliver complete and comprehensive documentation and records;
- c) Identify processes for management review of the Operation and Maintenance Plan;
- d) Identify, plan and prioritize all of the OM&R Work activities required to perform the maintenance and correct deficiencies;
- e) Document the sequence and interaction of all processes; and
- f) Detail procedures for service delivery.

The OMP and all updates shall be delivered as required in Table 401-2 [Schedule of Plans, Reports, and Data – Response Time Measures] of this Section, and shall specifically describe the procedures and work methods for all aspects of delivery of the operation and the maintenance services for the entire Bypass Infrastructure as defined within this Schedule and shall include at a minimum:

- a) Introduction of the service activities and the manner in which they are to be carried out;
- b) The relationship to the Asset Management Plan developed in Section 402 [Asset Preservation] to this Schedule; and
- c) Work Method Statements describe Project Co's process of delivery for each activity defined in this operation and maintenance specification. The following information shall be provided for each Work Method Statement;
  - Output objective including standards;
  - Fundamental process steps identified and described including requirements for reporting, communications, environmental, site safety, traffic control, and quality;
  - Functional relationships between each process step defined;
  - Resources;
  - References to applicable codes, standards, guides, and manuals;
  - Documented evidence that all applicable technical leaders have approved the Work Method Statement signifying a collaborative and coordinated approach to the development of the overall delivery process; and
  - Release date.

The processes and procedures included in the Operation and Maintenance Plan shall conform to, but are not limited to, the following service delivery requirements:

- Technical Requirements and all other requirements of this Project Agreement, including the OM&R Requirements;
- Work identification and planning;
- Stakeholder communication;
- Environmental compliance;
- Site safety;
- OH&S record and compliance and
- Emergency response.

The Operation and Maintenance Plan shall also include a work identification program which includes the processes to identify, prioritize, plan, schedule, manage, record and monitor completion of the operation and maintenance.

#### **401.4.4 OM&R Monthly Report**

The OM&R Monthly Report provides the Ministry with a status of Project Co's operation and maintenance activities each month.

The OM&R Monthly Report shall be delivered as required in Table 401-2 [Schedule of Plans, Reports, and Data – Response Time Measures] to this Section, and shall include at a minimum, the following content:

- Updated maintenance and rehabilitation program for the next rolling 12 month period showing all major activities completed and planned (including resurfacing, bridge rehabilitation and debris pond cleaning);
- Status of audit reports;
- Copies of all relevant newspaper clippings where both positive and negative commentary on the Bypass Infrastructure is noted;
- Summary of key events that occurred during the month and planned tasks for the next month; and
- Results of monthly Key Performance Measures (KPM) assessment, as outlined in Table 401-1 [Key Performance Measures (KPMs)] of this Section, and comparison to previous 12 months results.
- Monthly and Contract Year to date summaries of maintenance services, including scheduled and performed maintenance services allocated among the work activity classifications and identified as to work location (highway #, km reference, maintenance segment and number); and
- Delivery of the quality work plan, the work accomplishments report and a summary of Project Co's quality audits and dispositions.

#### **401.4.5 Traffic Count Data**

Traffic count information will be collected by the Ministry and incorporated into the Ministry traffic count database. Project Co may have access to the traffic count data.

#### **401.4.6 Asset Inventory Data**

The electronic asset inventory records of the Ministry need to be kept accurate and up to date. Asset inventory is required to be collected and input into the most current applicable Ministry corporate asset inventory system. These requirements are detailed in Table 401-3.

**Table 401- 3: Asset Inventory Requirements**

Asset Group	Provincial System	Data Delivery Requirements
<p>Pavements – Including travel lanes, shoulders, medians, rest area parking and other areas specified to be treated to adjacent highway standard</p>	<ul style="list-style-type: none"> <li>• Saskatchewan Pavement Preservation Database.</li> </ul>	<ul style="list-style-type: none"> <li>• All data inventory collection and reporting on an annual basis in accordance with Table 401.2 of this Section</li> <li>• Electronic inventory data is to be delivered in a format suitable for electronic importing directly into the relevant provincial corporate system.</li> </ul>
<p>Structures – Bridges, Major Retaining Walls, Major Culverts and Major Sign Structures (culverts greater than 3.0 m and retaining walls with greater than 2.0 m max height and with a wall face slope greater than 45°.)</p>	<ul style="list-style-type: none"> <li>• Saskatchewan Bridge Management System</li> <li>• Culvert Database</li> <li>• Sign Database</li> <li>• No corporate system for Major Retaining Walls</li> </ul>	<ul style="list-style-type: none"> <li>• All data inventory collection and reporting on an annual basis in accordance with Table 401-2 of this Section</li> <li>• Electronic inventory data is to be delivered in a format suitable for electronic importing directly into the relevant provincial corporate system.</li> <li>• Clearance, location and general Structure configuration (General arrangement) information is required prior to commissioning the Structure for public use.</li> </ul>
<p>Other Structures – Retaining walls (less than 2.0 m high), minor culverts and noise barriers                      Other drainage appurtenances – including curb and gutter, catch basins, flumes and manholes.                      Signs – including all regulatory, warning, guide, informational, advisory, construction and maintenance and route markers, but excluding</p>	<ul style="list-style-type: none"> <li>• Sign Database</li> <li>• Pavement Line Marking Database</li> <li>• Culvert Database</li> <li>• No corporate system for other assets</li> </ul>	<ul style="list-style-type: none"> <li>• All data inventory update collection and reporting on an annual basis in accordance with Table 401-2 of this Section.</li> <li>• Project Co shall supply a spreadsheet of inventory in a logical format and subsequent annual updates as required in accordance with Table 401.2 of this Section.</li> <li>• Project Co shall make allowance for future requirement to provide electronic inventory data in a format suitable for electronic</li> </ul>

Asset Group	Provincial System	Data Delivery Requirements
electronically controlled messages/displays. Other Highway Furniture – including fences, gates, guardrail and reflectors, and lineal safety features. Pavement Marking – including longitudinal, transverse and intersection markings as well as Thermoplastic and HRPM		importing directly into the relevant provincial corporate system
Electrical Components – including street lighting, traffic signals and control boxes	<ul style="list-style-type: none"> <li>• No system at present</li> </ul>	<ul style="list-style-type: none"> <li>• Project Co shall supply a spreadsheet of electrical inventory in a logical format and subsequent annual updates as required in accordance with Table 401.2 of this Section.</li> <li>• Project Co shall make allowance for future requirement to provide electronic inventory data in a format suitable for electronic importing directly into the relevant provincial corporate system</li> </ul>

Inventory data collected shall be in the format prescribed in the applicable Ministry manual for the relevant provincial system. The existing editions of these manuals are available through the Data Room or on the Ministry website.

**401.4.7 Network Status Videos**

Network status videos to document the condition of the network are to be produced every 2 years and to be no more than 1 month old at the time of delivery to the Ministry. The videos shall meet the following requirements:

- Equipment:
  - Single high resolution camera mounted onto the vehicle to record the right of way view of the roadway
  - Capable of delivering quality images, during all of the various conditions that the production survey may be undertaken.
  - Progressive scan, or equivalent to yield clear images from a moving vehicle

- Image View:
  - Continuous images of the full right-of-way including the pavement width, shoulders and roadside features such as signs, structures and guardrails
  - The horizon line shall be at approximately 80% of the way up the frame
- Image Resolution;
  - The minimum image resolution is to be a minimum 1300 x 1030 colour image
- Media and Format
  - The recording media is to be digital and provide a minimum 12 bit color images in JPEG format
  - The desired image file size is 100 to 150 kilobytes
- Recording;
  - Intervals Images will be taken at 10 m intervals
  - Project Co shall take all necessary measures to ensure that the image angle and magnification remain consistent throughout the surveys and brightness settings are constantly adjusted to yield high quality images
- Image Naming Convention:
  - Consistent with Ministry roadway naming convention with seven digit (i.e. XXX.XXX) numeric value that identifies the kilometre chainage of the image appended to the highway identification
- Image Header:
  - Each image, shall contain a header showing the date and time image taken, highway identification, lane number, kilometre chainage, latitude and longitude.

## **401.5 OPERATIONAL COMMUNICATIONS**

### **401.5.1 Highway Condition Reporting**

#### **401.5.1.1 Objective**

To communicate Bypass Infrastructure conditions to the Ministry, Local Authorities and the Police.

#### **401.5.1.2 Performance Measures**

#### **Condition**

**PO5.1.2a** Liaise with all relevant emergency service providers and provide assistance, if requested, and provide all key personnel contact information.

**PO5.1.2b** Provide a toll-free telephone service for Bypass Infrastructure condition reporting.

Response

**PO5.1.2c** Prepare and deliver an updated Bypass Infrastructure Condition Report to the Ministry at 7:30 a.m., 9:30 a.m. and 2:30 p.m. daily from November 1 to April 15 and at 10:00 a.m. daily from April 16 to October 31, using the Ministry’s terminology for reporting. Project Co shall also integrate reporting with the Ministry’s “Night Rider” program which requires a report at approximately 1:00 am.

**PO5.1.2d** Report immediately, upon detection or notification to Project Co, to the Ministry any adverse or extreme road surface conditions and changes in weather conditions affecting visibility and/or driving conditions that would require updating the highway hot-line or as specified by the Ministry.

**PO5.1.2e** Prepare and release immediately, upon approval by the Ministry, travel advisories as necessary to inform users of the Bypass Infrastructure of conditions identified in PO5.1.2d above.

**PO5.1.2f** Report immediately, upon detection or notification to Project Co, to the Ministry, all motor vehicle crash fatalities and other significant Incidents on the Bypass Infrastructure.

**PO5.1.2g** Project Co shall implement a system to measure accurately and record all Lane Closure events occurring on the Bypass Infrastructure. Project Co shall maintain in electronic format a log recording the start/end times and relevant details for all such Lane Closure events, which shall be a form which can be audited by the Ministry for conformity.

**401.5.1.3 Specific Requirements**

- a) Observe and record weather / road conditions and prepare and submit Bypass Infrastructure Condition Reports electronically using internet technology and in a format prescribed by the Ministry.
- b) Publish names and telephone numbers of key Project Co personnel in a manner accessible for Police and other Local Authorities.
- c) Communicate with appropriate Local Authorities and Police when conditions on the Bypass Infrastructure require the involvement of those Local Authorities and/or the Police.
- d) The toll-free telephone service shall at a minimum be attended by sufficient personnel 24 hours per day, 7 days a week to respond to reports of and requests Bypass Infrastructure conditions; and potential or existing Bypass Infrastructure hazards; to receive and record complaints or other comments or concerns from Local Authorities, the Police and the Ministry.
- e) Project Co shall utilize social media sites including, but not limited to, Facebook and Twitter.

All communications should be carried out in accordance with the provisions of Schedule 12, Communications Protocol.

#### **401.5.1.4 Notes**

The infrastructure condition report (the “**Infrastructure Condition Report**”) shall include surface conditions; weather, visibility, maintenance activities, load restrictions, travel advice Lane Closures and other Bypass Infrastructure traffic delays and the reason for such closures and delays.

#### **401.5.2 Stakeholder Communication**

##### **401.5.2.1 Objective**

To communicate effectively and efficiently with stakeholders

##### **401.5.2.2 Specific Requirements**

Project Co shall as a minimum:

- a) Respond in a timely and appropriate manner to public complaints and requests;
- b) Consult with local stakeholders including local industries (forestry, mining, oil and gas), the Police, Local Authorities, key commuters, transit authorities and school buses in order to take their needs into consideration when planning the delivery of services;
- c) Ensure optimum and proactive communication with local stakeholders whenever possible;
- d) Prepare and releases traffic advisories approved by the Ministry, when Lane Closures occur or when weather conditions are unsafe or have the potential to become unsafe for users of the Bypass Infrastructure; and
- e) Publish names and telephone numbers of key Project Co personnel for Police, emergency response services and other appropriate Local Authorities.

All communications should be carried out in accordance with the provisions of Schedule 12, Communications Protocol.

#### **401.5.3 Project Relationships**

##### **401.5.3.1 Objective**

The inter relationships between the Project parties is paramount to the overall success of the Project. This further extends to culture, where a “no surprises” environment shall exist.



**401.5.3.2 Performance Measures**

**PO5.3.2a** Project Integration: Project Co shall clearly make an effort to keep all parties informed on physical work progress and any Project issues that arise during each month.

**PO5.3.2b** Project Representation: Project Co shall publicly represent the Ministry in a positive manner.

**PO5.3.2c** Culture: Project Co shall act in the best interests of the Project.

**401.5.4 Public Relations - Customer Care**

**401.5.4.1 Objective**

To provide high quality communications to the public, stakeholders and Local Authorities in a courteous, prompt, consistent and professional manner.

**401.5.4.2 Performance Measures**

**Condition**

**PO5.4.2a** 90% satisfaction level achieved on the annual customer satisfaction survey

**Response**

**PO5.4.2b** Develop a Customer Care Plan as required in Table 401-2 [Schedule of Plans, Reports, and Data – Response Time Measures] of this Section, and implement processes to all of its internal and external relationships for delivery of services throughout the Operational Term.

**PO5.4.2c** Conduct a customer satisfaction survey that is to be undertaken by an independent certified agency with the questions / results provided to the Ministry annually.

**PO5.4.2d** Respond to the following correspondence issues within the timeframes shown in Table 401-4 below.

**Table 401- 4: Response Times for Public Correspondence**

Risk	Response Time
Very High - Injury or damage to significant public or private asset	1 hour
High - Unlikely to result in injury, but could result in damage to property	1 day

<b>Risk</b>	<b>Response Time</b>
Low - Unlikely to result in damage to property	5 days
None - Will not result in damage to property	10 days

In addition, respond to enquiries from the Minister's office within 6 hours.

#### **401.5.4.3 Specific Requirements**

Questions should be structured to obtain meaningful and relevant feedback, and should also include questions related to maintenance of the Bypass Infrastructure, including response times, levels of service, ride and winter performance.

The Customer Care Plan will as a minimum address the following issues:

- a) Identification of external customers and their interface with the Ministry on Bypass Infrastructure issues;
- b) Use of technology to facilitate communication between the customer, Project Co, and the Ministry on Bypass Infrastructure issues;
- c) Development of and implementation of a service request system in order to provide a seamless interface with the Ministry, others, management of information and Customer Care;
- d) Identification of critical Bypass Infrastructure issues and appropriate response times;
- e) Development of procedures for capturing potentially controversial situations in order that the Ministry remains informed;
- f) Customer satisfaction monitoring and reviews;
- g) Development of corporate standards for Customer Care; and
- h) Action plans or operational strategies to enhance Customer Care.

Implement customer care protocols that include, but are not limited to:

- a) Telephone - including time to pick up, greeting style, use of 1-800 numbers;
- b) Voicemail - including greeting style and standard information supplied, acknowledgments and clearance times;
- c) Email protocols and the production of an internet web site in conjunction with existing Ministry initiatives where necessary;
- d) Correspondence - including the ability to respond within 10 working days, the style of language, jargon avoidance, recording and filing; and
- e) Public counter and field contact protocols - including providing the customer with full attention, accurate information and contact recording.

Implement a communications register reporting system that maintains a record of all customer contact by telephone, facsimile, email, personal and written correspondence. As a minimum, the reporting system should include a description of the issue / complaint, time to acknowledge, time to meet on site if required and the time to complete action as appropriate (Note: sometimes a

complaint may be unjustified and/or satisfaction may not be possible if provincial policies are not acceptable by the customer. In those cases, a record of the advice provided, in a courteous manner, will be recognised as completeness of the resultant action.). The communications register will be available continuously online to the Ministry who will track through a sample of complaints/enquiries for meeting timeliness requirements and customer satisfaction.

Promote Project Co as the key contact with the public for Bypass Infrastructure related matters. Project Co's contact details are to be widely advertised.

Be available to respond to customers during the hours of 8:00 am to 5:00 pm, Monday to Friday and maintain a 24 hour call centre facility to receive, respond and log calls.

All communications should be carried out in accordance with the provisions of Schedule 12, Communications Protocol.

#### **401.5.4.4 Notes**

Public Relations - Customer Care requires determination and/or identification of issues and responding to the customer with information on the intended response. It encompasses the following activities:

- Answering general and specific enquiries or requests for information;
- Co-ordinating with the Provincial Highways Condition Centre to provide information and display accurate and timely messages on signage systems; and
- Receiving and processing applications from the public, authorizing a signage installation; and co-ordinating themes and messages with other communications from the Ministry.

The Ministry will transfer all Bypass Infrastructure-related enquiries to Project Co for response. Where inaccurate or untimely messages cause safety concerns or inconvenience to motorists, steps shall be immediately taken to correct the misinformation being presented.

Full compliance with Section 401.5.1 [Highway Condition Reporting] of this Section is required. Note that Project Co's positive coordination with the Provincial Highways Condition Centre is paramount in meeting this task.

#### **401.5.5 Utilities Coordination**

##### **401.5.5.1 Objective**

To coordinate and manage applications from Utilities requiring access to the Bypass Infrastructure.

### **401.5.5.2 Performance Measures**

#### **Condition**

**PO5.5.2a** Liaise with the various Utilities to coordinate Utility Work with the maintenance and the rehabilitation.

#### **Response**

**PO5.5.2b** Report any problems with the performance of the Utilities within 24hrs in relation to safety matters and one week in relation to any other matter to the Ministry.

### **401.5.5.3 Specific Requirements**

- a) Manage and coordinate Utility Work in accordance with Section 200.6.2 of Schedule 15-2 – Design and Construction.
- b) Address all applications from Utilities in accordance with Section 200.6.2 of Schedule 15-2 – Design and Construction.
- c) All Utility Agreements with the Ministry will remain in place and therefore the terms and conditions specified will apply to the Project in full. Project Co shall comply with Section 200.6.2 Utilities of this Schedule in respect of all matters concerning Utility relocation specifically required for the Project Work, and repairs to damage to Utilities caused by Project Co.
- d) Where Project Work impacts Utilities, Project Co is required to comply with the applicable requirements of Section 200.6.2 of Schedule 15-2 – Design and Construction.
- e) Utilities coordination shall be conducted in accordance with the Customer Care Plan in dealings with other contractors.

### **401.5.5.4 Notes**

- Utilities are entitled and/or permitted to install services in the Bypass Infrastructure corridor. However, the integrity of the Bypass Infrastructure shall be protected, damage minimized, and the Ministry indemnified against any future claims of liability in accordance with Section 200.6.2 of Schedule 15-2 – Design and Construction.
- Issues regarding Utilities coordination, to be addressed in accordance with Section 200.6.2 of Schedule 15-2 – Design and Construction, are likely to include:
  - Timing of utility installation in terms of coordinating with the Works and OM&R Work and identification of potential conflicts with other work on the Bypass Infrastructure;
  - Impact of the proposed Utility Work on Project Co's Performance Measures; and
  - Conditions that Project Co would like to impose on the Utilities.
- The final approval of the application and associated conditions regarding Utility Work will be the responsibility of the Ministry in accordance with Section 200.6.2 of Schedule 15-2 – Design and Construction.

- All contact initiated by Utilities will be handled in accordance with Section 200.6.2 of Schedule 15-2 – Design and Construction.
- The Railway Companies will carry out regular Operation and Maintenance work on their apparatus on level crossings.

#### **401.5.6 Development Coordination**

##### **401.5.6.1 Objective**

To liaise with Third Party Contractors and other contractors to coordinate access work to development adjacent to or on the Bypass Infrastructure that may occur by the direction of or permitted by the Ministry.

##### **401.5.6.2 Performance Measures**

###### **Condition**

There are no condition measures for this specification.

###### **Response**

**PO5.6.2a** Report any problems with the performance of a Third Party Contractor and other contractors working on behalf of the Ministry or permitted by the Ministry within 30 minutes in relation to safety matters and one week in relation to any other matter to the Ministry.

##### **401.5.6.3 Specific Requirements**

- a) The integrity of the Bypass Infrastructure shall be protected and damage minimized.
- b) Development coordination shall be conducted in accordance with the Customer Care Plan in dealings with other contractors.

#### **401.5.7 Communications System**

##### **401.5.7.1 Objective**

To facilitate effective communications between Project Co's personnel.

##### **401.5.7.2 Specific Requirements**

Project Co shall provide a communication system for vehicles and offices and ensure that each radio is compatible with each other and in compliance with CRTC regulations. Project Co shall also provide VHF radios for vehicles that are capable of communicating with Ministry radios. Project Co shall also provide cellular telephones to all equipment operators.

## **401.5.8 Railroad Coordination**

### **401.5.8.1 Objective**

To liaise with Railway Companies to undertake any OM&R Work within the railway's right-of-way.

### **401.5.8.2 Specific Requirements**

All OM&R Work within the railway right-of-way shall be done in accordance with Section 200.2.8 Railways of this Schedule.

## **401.6 SURFACE MAINTENANCE**

### **401.6.1 Highway Pavement Maintenance**

#### **401.6.1.1 Objective**

To ensure paved highway surfaces on the Bypass Infrastructure (including paved bridge decks) are safe, smooth, stable, and sealed to prevent moisture from penetrating the pavement surface.

#### **401.6.1.2 Performance Measures**

#### **Condition**

**PO6.1.3a** Ensure consistency with finished patches in the travel lane or shoulder, and the adjacent pavement or shoulder.

**PO6.1.3b** Ensure that the edges of the patch that tie in elevation to existing pavements are feathered to an angle of no less than 30° from a line perpendicular to the centreline.

**PO6.1.3c** Ensure that the root cause of pavement failure is determined and reasonable attempts are made to deal with the failure before commencing repairs.

#### **Response**

**PO6.1.3d** Complete asphalt pavement patching and routing and crack sealing to address safety issues within the maximum times shown in Table 401-5 below.

**Table 401- 5: Asphalt Pavement Deficiency Response Times**

<b>Pavement Deficiency</b>	<b>Response Time</b>
Pot-hole on mainline and ramps.	24 hrs.
Pot-hole on mainline and ramp shoulders.	7 days
Pot-hole on paved Service Roads and Crossroads.	7 days
Bleeding on travel lane where pavement surface exhibits a wet look from distinctive excess bituminous binder being present greater than 2 m <sup>2</sup> .	24 hrs.
Bleeding (as defined above) on travel lane less than 2 m <sup>2</sup> .	30 days
Distortions resulting in fair to poor car control presenting a safety hazard.	12 hrs.
Distortions not presenting a safety hazard.	30 days

Notes:

A digital photo and coordinates for each pothole shall be collected and delivered to the Ministry in a format compatible with their collection database. The pothole will also be flagged in accordance with the Ministry’s preservation policy and procedures standards.

**PO6.1.3e**

Complete asphalt pavement surface distress repairs to correct each deficiency within the maximum response times shown in Table 401-6 below.

**Table 401- 6: Asphalt Pavement Surface Distress Response Times**

<b>Pavement Deficiency</b>	<b>Minimum Severity Level</b>	<b>Response Time</b>
Longitudinal Cracking	Single or multiple, moderate spalling, mean unsealed crack width greater than 5 mm as measured prior to June 15.	90 days
Pavement Edge Cracking	Single or multiple, moderate spalling, mean unsealed crack width greater than 5 mm as measured prior to June 15.	90 days

<b>Pavement Deficiency</b>	<b>Minimum Severity Level</b>	<b>Response Time</b>
Transverse Cracking	Single or multiple, moderate spalling, mean unsealed crack width greater than 5 mm as measured prior to June 15	90 days
Block Cracking	Interconnected cracks forming a complete block pattern with sides of 1 m or smaller, slight spalling and no pumping	Before Sept.15
Shoving	Longitudinal displacement of a localized area of the pavement surface causing rough ride.	Before Sept.15

**PO6.1.3f** Complete permanent pavement patching of depressed cracks before September 15.

**PO6.1.3g** Complete Portland cement concrete pavement surface distress repairs to correct each deficiency within the maximum response times shown in Table 401- 6A.

**Table 401- 6A: Portland Cement Concrete Pavement Surface Distress Response Times**

<b>Pavement Deficiency</b>	<b>Minimum Severity Level</b>	<b>Response Time</b>
Cracking	Cracks greater than 6 mm in width shall be routed and sealed	Before Sept.15
	Diagonal or corner slab cracking shall be further investigated to determine the cause and complete repairs	Before Sept.15
Joint Failure	Joint failures, including blow-ups	24 hours
Joint Sealant Loss	Broken, pulled out or removed sealant over a continuous length greater than 300 mm in any joint	Before Sept.15
Joint Cracking and Spalling	Greater than 75 mm in depth or 150 mm measured in any direction adjacent to or in the vicinity of the pavement joint	Temporary Repair within 24 hours Permanent Repair before Sept 15



<b>Pavement Deficiency</b>	<b>Minimum Severity Level</b>	<b>Response Time</b>
Potholes	Greater than 150 mm in width or 75 mm in depth	Temporary Repair within 48 hours Permanent Repair before Sept. 15
Distortion (Sagging/Slab Warping)	Depression or warp is greater than 6 mm when measured over 3 m length	Before Sept.15
Scaling / Ravelling	Surface areas greater than 0.5 square metres in size or occupying over 20 percent of a single slab area which exhibit distress	Before Sept.15
Polishing	Areas which exhibit a physical appearance of polishing of the surface course, aggregate and have a higher than average incidence of accidents	Before Sept.15
Stepping	Displacement greater than 6 mm	15 days

**401.6.1.3 Specific Requirements**

- a) Finished patches are to be consistent with the line, grade, crossfall and compaction of the adjacent pavement.
- b) Overlay patches are to be 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.
- c) Patch depth is to be equal to that of the distressed pavement but never less than 60 mm.
- d) The choice of treatment selection for maintenance purposes is solely at the discretion of Project Co except that the following overlying principles will apply:
  - The Asset Preservation Performance Measures (APPMs) set out in Section 402 [Asset Preservation ] to this Schedule shall be complied with;
  - Innovation is encouraged; and
  - The optimization of the life cycle of pavements and pavement materials is encouraged but not to the detriment of road safety or the targets and Performance Measures set or established in this Project Agreement.

**401.6.2 Highway Shoulder Maintenance**

**401.6.2.1 Objective**

To provide a smooth and safe stopping area with free-flowing drainage off the travel lanes and through the road base.

**401.6.2.2 Performance Measures**

**Condition**

There are no condition measures for this specification.

**Response**

**PO6.2.2a** The following deficiencies shall be repaired within the maximum times shown in Table 401-7 below.

**Table 401- 7: Shoulder Surface Deficiency Response Times**

<b>Shoulder Surface Deficiency</b>	<b>Maximum Response Time</b>
i) Pavement edge drop-off 5 cm or more in depth	30 days
ii) Settled and eroded sections more than 5 cm in depth presenting a safety hazard	7 days
iii) Loose or soft shoulders presenting a safety hazard	30 days
iv) Loss of line, grade, and crossfall presenting a safety hazard	30 days
v) Removal of vegetation presenting a safety hazard	30 days
vi) Removal of turf, sod and other vegetation	30 days

**401.6.2.3 Specific Requirements**

- a) Bypass Infrastructure shoulders are to be safe, smooth, stable, free-draining, and compacted.
- b) Bypass Infrastructure shoulders are to be repaired and sub-surface materials placed in accordance with Section 401.6.3 [Granular Base Maintenance] of this Section.
- c) Paved shoulders are to be repaired in accordance with Section 401.6.1 [Highway Pavement Maintenance] of this Section.

- d) Granular or other material is to be removed from the pavement surface in accordance with Section 401.6.4 [Pavement Surface Cleaning and Debris Removal] of this Section.

### **401.6.3 Granular Base Maintenance**

#### **401.6.3.1 Objective**

To repair deficient areas of granular base and install drainage where required to provide a supporting granular base structure for highway surfaces on the Bypass Infrastructure.

#### **401.6.3.2 Performance Measures**

#### **Condition**

There are no condition measures for this specification.

#### **Response**

**PO6.3.2a** Identify the source of granular base failure and remedy within the response times required in Section 401.6.1 [Highway Pavement Maintenance] of this Section.

#### **401.6.3.3 Specific Requirements**

- a) Repairs are to be identified and carried out in order of priority as determined by Project Co to enhance safety and to protect the Bypass Infrastructure.
- b) Where deemed necessary, correct failures by removing unsuitable materials, by providing free drainage from excavation and backfilling and by compacting with suitable materials.
- c) Restore paved surfaces in accordance with Sections 401. 6.1 [Highway Pavement Maintenance], and 401.11.2 [Bridge Deck Maintenance] of this Section.
- d) Install drainage appurtenances in accordance with Section 401.7.2 [Drainage Appurtenance Maintenance] of this Section.

### **401.6.4 Pavement Surface Cleaning and Debris Removal**

#### **401.6.4.1 Objective**

To protect users of the Bypass Infrastructure from potentially hazardous pavement surface conditions caused by debris, or a build-up of accumulated dirt, sand or gravel; and to ensure surface drainage is not hindered by these accumulations or debris.

**401.6.4.2 Performance Measures**

**Condition**

**PO6.4.2a** No accumulation adjacent to curbing or barriers shall impair the free flow of drainage paths.

**Response**

**PO6.4.2b** The removal of debris should be started within the times shown in Table 401-8 and completed as soon as reasonably possible.

**Table 401- 8: Debris Removal Response Times**

<b>Obstruction</b>	<b>Mainline</b>	<b>Ramps</b>	<b>Paved Service and Cross Roads</b>
Debris or spilled material occupying more than 25% of the width of the travel lanes.	3h	3h	6h
Debris or spilled material encroaching on the travel lanes	12h	12h	24h
Debris or spilled material on the shoulders	24h	24h	48h
Dead animals	3h	3h	6

*Legend: h – hours*

**PO6.4.2c** Highways should be cleaned within 7 days where an accumulation:  
 (i) obscures line visibility, or;  
 (ii) creates a visibility problem for users of the Bypass Infrastructure, or;  
 (iii) creates an air quality problem that conflicts with local by-laws.

**PO6.4.2d** Dirt, debris, sand and/or gravel on paved surfaces which poses a hazard to users of the Bypass Infrastructure shall be removed within 24 hours.

**401.6.4.3 Specific Requirements**

- a) Perform cleaning work on debris accumulations adjacent to curbing or barriers in accordance with the Performance Measures in Section 401.6.5 [Curb, Island and Barrier Maintenance] of this Section.
- b) Establish additional patrols through the area when debris on the travel lanes and shoulders, occurs more than once in a 24 hour period so that debris is removed within the Performance Measures specified in above. Discontinue the additional patrols

when the frequency of debris falling on the travel lanes and shoulders is less than 2 in a 24 hour period.

- c) If the debris is too large for immediate removal, secure the area in accordance with Section 401.10.10 [Highway Traffic Control] of this Section and remove as soon as possible.
- d) For volumes of debris on travel lanes or shoulders that are greater than 10 m<sup>3</sup> per location, apply Section 401.12.5 [Mud and Earth Slide Response] of this Section.
- e) Dispose of dead animals at an appropriate site properly licenced to dispose of such organic waste.

#### **401.6.4.4 Notes**

Cleaning of highway includes removing accumulations of dirt, sand and/or gravel from the travel lanes, centrelines, shoulders, curbs, intersections, traffic islands and along medians and/or roadside barriers to provide a safe, clean, free-draining condition.

### **401.6.5 Curb, Island and Barrier Maintenance**

#### **401.6.5.1 Objective**

To provide a safe operating environment for users of the Bypass Infrastructure and to allow for adequate drainage associated with curbs, traffic islands, roadside and median barriers, anti-glare screens, reflectors and impact attenuators.

#### **401.6.5.2 Performance Measures**

##### **Condition**

There are no condition measures for this specification.

##### **Response**

**PO6.5.2a** Concrete barrier with structural damage including cracking and breakage in excess of 900 cm<sup>2</sup> that affects the barriers performance are to be replaced within 30 days.

**PO6.5.2b** Repair of concrete barriers with damage of less than 900 cm<sup>2</sup> of surface area are to be completed within 12 months.

**PO6.5.2c** All drainage holes are to be cleaned once annually to ensure the free passage of water and:

- (i) When a blockage is causing a situation that is potentially hazardous to users of the Bypass Infrastructure, affected drainage holes are to be cleared of debris within 3 hours; or

- (ii) When a blockage is causing is causing ponding outside the traveled lane, affected drainage holes are to be cleared within 12 hours.

**PO6.5.2d** Impact attenuators, supports or fasteners that are damaged, destroyed and missing are to be replaced within 3 days.

**PO6.5.2e** Roadside barriers that are overlapped in the direction against the flow of traffic are to be repaired within 3 days.

**PO6.5.2f** Roadside barriers with any of the following deficiencies shall be repaired within 10 days:

- (i) multiple missing, broken, loose or insecurely set posts;
- (ii) multiple posts out of plumb perpendicular to the direction of travel by more than 50 mm over the height of the post;
- (iii) with protrusions towards the flow of traffic caused by ripped, torn or cut segments of guide rail;
- (iv) with multiple guide rail that are not bolted securely to the mounting posts (via blocks);
- (v) with multiple guide rail that have missing bolts or nuts; or
- (vi) with multiple excessively split, cracked or rotted posts or blocks

**PO6.5.2g** Roadside barriers with any of the following deficiencies shall be repaired by September 30:

- (i) a single missing, broken, loose or insecurely set post;
- (ii) with single excessively split, cracked or rotted post or block;
- (iii) with perforated, ripped, torn or cut segments;
- (iv) with single post out of plumb by more than 50 mm over the height of the post perpendicular to the direction of travel or multiple rotated blocks;
- (v) that are bent or twisted, exhibiting a flange to flange differential measurement exceeding 40 mm spread or a closure in excess of 20 mm from the adjacent undamaged section;
- (vi) a single roadside barriers that is not bolted securely to the mounting posts (via blocks);
- (vii) a single roadside barriers that is missing up to 2 bolts or nuts per connection;
- (viii) that are misaligned vertically or horizontally by more than plus or minus 50 mm from the height or alignment of the adjacent sections; or that are more than 100 mm higher or 50 mm lower than the design height.

**PO6.5.2h** Traffic island surfaces that are broken or potholed are to be restored to a smooth, stable condition within 15 days.

**PO6.5.2i** Curbs with damage including cracking and breakage that affects their performance are to be repaired or replaced as required to provide a smooth, sound and interconnected curb within 30 days.

**PO6.5.2j** Cable guide rail with frayed and/or broken cables, cable height exceeding the design standard by more than 5 cm or exposed anchors or missing hardware shall be repaired within 3 days.

**PO6.5.2k** Cable guide rail with damaged posts shall be repaired within 10 days, when the ground is not frozen,

**PO6.5.2l** When ground is frozen, cable guide rail with damaged posts, cables and hardware shall be temporarily repaired within 10 days and permanently repaired by May 15.

**PO6.5.2m** Cable guide rail with missing or damaged reflectorized strips shall be repaired within 10 days

#### **401.6.5.3 Specific Requirements**

- a) Barrier repairs are to be completed using material of the same type and quality as the existing installation, or by using an epoxy repair product approved in writing by the Ministry.
- b) Damaged or missing concrete barrier reflectors are to be replaced in accordance with Section 401.10.2 [Sign System Maintenance] of this Section.
- c) Construct new asphalt and/or concrete curbs as required.
- d) Install new barriers as required to enhance the safety of users of the Bypass Infrastructure.

### **401.7 DRAINAGE MAINTENANCE**

#### **401.7.1 Ditch and Watercourse Maintenance**

##### **401.7.1.1 Objective**

To provide safe, unobstructed drainage for all highway surface runoff, natural roadside runoff and ditches; and to create collection areas for debris and ice and snow.

##### **401.7.1.2 Performance Measures**

#### **Condition**

There are no condition measures for this specification.

#### **Response**

**PO7.1.2a** Except where specifically designed, ditches shall be free of localized depressions containing ponded water greater than 20 cm in depth over 10 m length. All repairs shall be completed by October 31.

- PO7.1.2b** Except where specifically designed, ditches shall be free of drop-offs greater than 10 cm over a length of 10 m. All repairs shall be completed by October 31.
- PO7.1.2c** Ditches shall be free from obstructions (e.g. fallen debris, debris dams, sloughs, vegetation etc.) which cover more than 30% of the ditch bottom and is 20 cm in height. All repairs shall be completed by October 31.
- PO7.1.2d** Plant growth within ditches and off-takes shall be controlled within the cross section of the channel. Notwithstanding Sections 401 and 402 of Schedule 15-3 – OM&R and Handback, all plant growth shall be cut at least once per year within the cross section of the channel no later than October 31. Cuttings shall not pollute or contaminate the drainage system or the surrounding environment or create watercourse blockages.
- PO7.1.2e** Ditch grade line erosion over more than any 20 m length of the drainage ditch shall be corrected by October 31 in the year of discovery. All eroded areas are to be repaired or rehabilitated in a manner that meets the standards and prevents further or future erosion. Replanting of vegetation within restored areas shall occur during periods or seasons in accordance with planting specifications for the particular products being planted.
- PO7.1.2f** Where, in the opinion of Project Co, minor erosion found in a ditch line is not progressing, repairs may be deferred. These deferred areas are to be noted in the annual drainage inspections and monitored annually to verify that erosion has ceased.
- PO7.1.2g** Sediments entering watercourses shall be minimized. Sediment deposited within ditches, which impedes drainage, as outlined in these Standards shall be removed and disposed of in a manner that does not result in pollution to the natural environment within or external to the roadway. All repairs shall be completed by October 31.
- PO7.1.2h** Slopes or embankments damaged as a result of ditch and watercourse maintenance shall be restored to a stable configuration and, if necessary, re-seeded or sodded to prevent soil erosion. Any seeding and/or sodding undertaken by Project Co shall be done in accordance with planting specifications for the particular product being used. All repairs shall be completed by October 31.
- PO7.1.2i** Project Co shall treat localized flooding within the right-of-way or on the pavement structure as an emergency. Maintenance repairs to contain or remove the floodwater and the cause of the flooding shall be initiated within 3 hours of discovery.



### **401.7.1.3 Specific Requirements**

- a) Off-takes and drainage easements are to be clean to allow efficient drainage of the Bypass Infrastructure.
- b) Ensure flow by removing snow and ice from ditches near drainage structures and restoring flow in frozen drainage structures.
- c) Notify the Ministry of any obstructions to water flow which threaten the integrity of the Bypass Infrastructure; and remove obstructions preventing the free flow of water, including obstructions which may be upstream from the Bypass Infrastructure, adjacent to the Bypass Infrastructure or immediately downstream.
- d) Restore and/or correct the cross section, capacity and grade of ditches and watercourses by removing debris, debris dams and sloughs from ditches and watercourses and repairing damage to embankments and backslopes caused by erosion.
- e) Restore ditch elevations below the bottom elevation of the sub-base to ensure free drainage of the Bypass Infrastructure.
- 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 structures from becoming obstructed.
- g) When correcting the ditch profile, re-set or replace drainage appurtenances in accordance with Section 401.7.2 [Drainage Appurtenance Maintenance] of this Section.
- h) Shoulder widths are not to be reduced or undermined during the provision of the services.
- I) Ensure Bypass Infrastructure protection by constructing new ditches or reconstructed ditches as required.

### **401.7.2 Drainage Appurtenance Maintenance**

#### **401.7.2.1 Objective**

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

#### **401.7.2.2 Performance Measures**

##### **Condition**

There are no condition measures for this specification.

**Response**

- PO7.2.2a** Remove any obstruction, repair or start (and complete as soon as practicably possible given the conditions) to replace drainage appurtenances within the maximum times shown.
- PO7.2.2b** Upon identifying an obstruction or damaged drainage appliance or upon notification from the Ministry within 24 hours apply for a permit if necessary and then remove any obstruction and repair or replace any damaged drainage appliance experiencing reduction in water flow capacity of 50% or more, or where there is a history of drainage problems as identified by the Ministry, within 7 days of such identification or notification or receiving the permit.
- PO7.2.2c** Unplanned internal obstructions affecting 10% of the height shall be removed in a manner that minimizes contamination of the watercourse within 6 months of discovery.
- PO7.2.2d** Unplanned obstructions at culvert inlets or outlets restricting the design flow of water to or from the culvert by more than 10% of the height shall be removed in a manner that minimizes contamination of the watercourse within 6 months of discovery.
- PO7.2.2e** Culvert aprons and headwalls which have been scoured over 20% of their area to depths greater than 100 mm below the invert of the culvert, damaged structurally or which have separated or moved from the culvert or the fill embankment by more than 50 mm shall be repaired or replaced within 6 months of discovery.
- PO7.2.2f** Culvert inlets and outlets including plunge pools deformed by more than 25% of their original shape shall be repaired or replaced within 6 months of discovery.
- PO7.2.2g** Culvert sections that have become separated or uncoupled shall be repaired or replaced within 6 months of discovery.
- PO7.2.2h** Ruptured or buckled culverts will be repaired or replaced within 6 months of discovery.
- PO7.2.2i** Culverts experiencing frost heaving that creates a pavement bump, shoulder bump or step condition greater than 20 mm and/or alters the gradient of the drainage by more than one hundred 150 mm when measured with a 1.2 m straightedge (rut bar) will be corrected or repaired within 6 months of discovery.
- PO7.2.2j** Ditches or watercourses entering and/or leaving culverts shall not be allowed to erode, to depths greater than 100 mm below the elevation of the bottom of the culvert or bed load level over a 3 m length, unless this was part of the original watercourse design (plunge pools, habitat pools).

**PO7.2.2k** Unplanned sedimentation deposited in depths greater than 50 mm over 20% of culverts length shall be removed in a manner that minimizes contamination of the watercourse within 6 months of discovery.

**PO7.2.2l** Damage to exposed ends of concrete or steel culverts affecting structural integrity, slope stability, flow capacity or durability of the culvert shall be repaired within 6 months of discovery.

**PO7.2.2m** Unsound or delaminated areas of concrete culverts shall be removed to the limits of sound concrete and repaired within 6 months of discovery.

**PO7.2.2n** Damage to safety end treatments that reduces their safety effectiveness or restricts flow of the watercourse.

### **401.7.2.3 Specific Requirements**

- a) These requirements are also applicable to all driveway drainage structures on the service and cross roads.
- b) All Bypass Infrastructure drainage appurtenances, trash racks and related hardware are to be maintained in working condition.
- c) Drainage appurtenances are to be free of debris, winter abrasive, and sedimentation.
- d) Drainage appurtenances that are missing or worn, bent, broken, folded, disconnected, unravelled or damaged are to be repaired, or replaced if repair is not practicable.
- e) Damaged asphalt curbs, flumes and spillways are to be replaced if patching is not practicable, in accordance with Section 401.6.5 [Curb, Island and Barrier Maintenance] of this Section.
- f) Riprap is to be placed to fill scour and erosion of foundation material to prevent future erosion at the inlet and/or outlet of the drainage appliance as approved in writing by the Ministry and in accordance with Section 401.7.3 [Watercourse Maintenance] of this Section.

## **401.7.3 Watercourse Maintenance**

### **401.7.3.1 Objective**

To prevent or repair scour and erosion damage to the Bypass Infrastructure and its structures at watercourses.

### **401.7.3.2 Performance Measures**

#### **Condition**

There are no condition measures for this specification.

## Response

**PO7.3.2a** Prepare areas to receive riprap and place riprap where there has been or there is potential for scour and erosion of natural or man-made shores and their banks within 2 hours, after determining that it is safe to proceed with the work. If Project Co's assessment indicates that the work cannot safely commence within 2 hours, Project Co shall notify the Ministry and shall commence work immediately when Project Co determines it is safe to do so.

**PO7.3.2b** Maintenance repairs to shores, banks and watercourses are to be completed within 5 days of the elimination of the obstruction.

**PO7.3.2c** Upstream obstructions and debris are to be removed annually.

### **401.7.3.3 Specific Requirements**

- a) All obstructions, beaver dams and Debris that threaten to break open and cause excessive channel flow or debris flows with resultant damage to the Bypass Infrastructure and its structures are to be removed; including all trees leaning toward the watercourse and threatening to fall into the water.
- b) Inspect the Bypass Infrastructure 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, in accordance with Section 401.13.2 [Highway Patrol] of this Section
- c) Immediately, when 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 users of the Bypass Infrastructure and initiate highway closure procedures, if necessary, in accordance with Section 401.13.2 [Highway Patrol] of this Section.
- d) Provide for adequate catchment areas for future material and debris containment; and dispose of all removed debris.
- e) Riprap is to be of sufficient to withstand a water flow representing a flood.

## **401.8 WINTER OPERATION AND MAINTENANCE**

### **401.8.1 Highway Snow Plowing**

#### **401.8.1.1 Objective**

To remove loose snow, slush and compacted snow; to protect users of the Bypass Infrastructure from situations that are hazardous; to ensure the safe and efficient movement of traffic; and to ensure that Project Co utilizes and deploys those resources that are required to comply with this Section, in a manner which anticipates and responds in advance of a snowfall.

### 401.8.1.2 Performance Measures

#### Condition

**PO8.1.2a** Commence snow plowing before the depth of snow accumulation reaches 20 mm unless visibility is less than 200 m (as defined by Environment Canada) as determined from the Regina Airport Weather Station. Only emergency work (protection of others from injury or death) is carried out when visibility is less than 200 m. This work will only be performed to assist emergency personnel, if requested.

**PO8.1.2b** Ensure that depth of snow accumulations on the full width of the travel lanes are below the maximum allowable accumulations as shown in Table 401-9 at all times, unless the visibility drops to less than 100 m, at such time, equipment will be removed from the road at the nearest safe location.

When visibility is restored to greater than 200 m, Project Co shall commence snow plowing within one hour and subsequently achieve the Maximum Allowable Accumulations in Table 401-9 within an additional four hours.

**Table 401- 9: Maximum Allowable Accumulations**

Location	Maximum Allowable Accumulation
All main line and ramps	40 mm
Paved Service and Cross Roads	80 mm

#### Response

**PO8.1.2c** Maximum Time to bare pavement after a Storm Event on main line and ramps between Highway 1 West and Highway 11, shown as Segment “A” on the attached sketches in Appendix B to Schedule 15-3 – OM&R and Handback, shall be 4 hours for both the inner and outer lanes. Isolated patches of icy or compacted snow shall be allowed but the aggregate total in any lane kilometre, shall not exceed 50 m.

**PO8.1.2d** Maximum Time to bare pavement on the main line and ramps between the Regina City Limits and Highway 48, shown as Segment “D” on the attached sketches in Appendix B to Schedule 15-3 – OM&R and Handback, shall be 4 hours for the outer lane and 8 hours for the inner lane, if the Storm Event ends between 2 am and 10 pm. Isolated patches of icy or compacted snow shall be allowed but the aggregate total in any lane kilometre, shall not exceed 50 m.

- PO8.1.2e** Maximum Time to bare pavement on the main line and ramps between the Regina City Limits and Highway 48, shown as Segment “D” on the attached sketches in Appendix B to Schedule 15-3 – OM&R and Handback, shall be by 6 am for the outer lane and 10 am for the inner lane, if the Storm Event ends between 10 pm and 2 am. Isolated patches of icy or compacted snow shall be allowed but the aggregate total in any lane kilometre, shall not exceed 50 m.
- PO8.1.2f** Maximum Time to bare pavement after a Storm Event on the main line and ramps between Highway 48 and the eastern Project Limits shown as Segment “E” on the attached sketches in Appendix B to Schedule 15-3 – OM&R and Handback, between Highway 6 and the Regina City Limits, shown as Segment “C” on the attached sketches in Appendix B to Schedule 15-3 – OM&R and Handback, and between the Highway 1 interchange west of Regina and Highway 6, shown as Segment “B” on the attached sketches in Appendix B to Schedule 15-3 – OM&R and Handback, shall be 6 hours for the outer lane and 8 hours for the inner lane. Isolated patches of icy or compacted snow shall be allowed but the aggregate total in any lane kilometre, shall not exceed 50 m.
- PO8.1.2g** Maximum Time to bare pavement after a Storm Event on all paved Service Roads and Crossroads shall be 12 hours except the southern Service Road east of Pilot Butte Interchange which shall have a maximum time to bare pavement of 6 hours. Isolated patches of icy or compacted snow shall be allowed but the aggregate total in any lane kilometre, shall not exceed 100 m.
- PO8.1.2h** If an extended periods of below minus twenty degree Celsius makes it impossible for Project Co to comply with the above bare pavement requirements, Project Co shall remedy unsafe conditions including but not limited to roughness and slippery surfaces, until such time as the temperature rises and the bare pavement time lines trigger.
- PO8.1.2i** In no instance, shall the windrow on the right shoulder in front of guide rail occupy more than 20% of the shoulder width. Both shoulder widths are be cleared at the end of a Storm Event, except the windrow on the left shoulder (inner shoulder) in front of guide rail where no more than 20% of the shoulder width shall be occupied at any time.
- PO8.1.2j** The plowing of interchange ramps shall occur in conjunction with the main line such that at no point in time shall the windrow at the interchange exit or entrance gore exceed 300 mm in height.

**PO8.1.2k** Project Co shall remove all snow and ice build-up from shoulders including, without limitation, the shoulder area in front of guide rails, concrete barriers, bridge barriers, guide rail safety attenuators and the high side of super-elevated ramps within the time frames as shown in Table 401-10.

**Table 401- 10: Cleanup Time after a Storm Event**

Location	Clean up time (Hrs.)
All main line and ramps	24
Paved Service and Cross Roads	48

**PO8.1.2l** Push snow and ice beyond the shoulder edge within the times shown in Table 401-11 from the end of precipitation as measured by the Regina Airport Weather Station.

**Table 401- 11: Response Times – Shoulder Clean-up**

Main Line	Ramps	Paved Service and Cross Roads
4 d	6 d	10 d

*Legend: d - days*

**PO8.1.2m** In addition to the above all superelevated curves on ramps, Project Co shall push snow and ice beyond the edge within 2 days of the end of precipitation as measured by the Regina Airport Weather Station to prevent snowmelt drainage onto the travel lanes. When guardrail prevents the complete removal of the snow from the shoulder edge, Project Co shall deal with any resulting condition that is hazardous.

**PO8.1.2n** Specific Requirements:

- a) When snowfall is forecast, proactively:
  - Increase snow and weather observations, monitoring and reviewing current weather station information;
  - Extrapolate from observations and broader weather forecasts to anticipate local road conditions;
  - Increase patrols as outlined in Section 401.13.2 [Highway Patrol] of this Section;
  - Notify and deploy resources in advance, which are sufficient to respond to anticipated snowfall; and
  - Communicate internally and externally of actions to be taken.
- b) In response to unforeseen snowfall:
  - Notify/deploy resources; and
  - Commence removal of snow and slush in accordance with the time frames outlined above.

- c) Plow overpasses and interchanges without depositing snow on the underlying Bypass Infrastructure, roadways or railways.

**401.8.1.3 Notes**

In allocating resources, appropriate attention shall be given to key geographic areas (e.g. known frequent snowfall and/or blowing snow areas) and areas known to be impacted first by deposits of snowfall and slush prior to the occurrence of the anticipated snowfall to ensure that snow and slush removal will commence early in severely impacted areas.

**401.8.2 Winter Abrasive and Chemical Snow and Ice Control**

**401.8.2.1 Objective**

To facilitate the safe and efficient movement of traffic on the Bypass Infrastructure in winter conditions through the use of winter abrasives and chemical snow and ice control applications, and to ensure that Project Co utilizes and deploys resources in a manner which anticipates and responds in advance of a weather event.

**401.8.2.2 Performance Measures**

**Condition**

There are no condition measures for this specification.

**Response**

**PO8.2.2a** Deploy resources to maintenance facilities at least 60 minutes in advance of a forecasted weather event.

**PO8.2.2b** In extended periods of extreme cold, mitigate hazardous conditions immediately.

**PO8.2.2c** Restore traction within the response times, as specified in the Table 401-12:

**Table 401- 12: Traction Restoration Response Times**

Condition	Location	Main Line	Ramps	Paved Service and Cross Roads
(i) Freezing rain	All locations	2 h	3 h	6 h
(ii) Black ice	All locations	2 h	3 h	6 h
(iii) After snowfall	All locations	*	*	*



Condition	Location	Main Line	Ramps	Paved Service and Cross Roads
(iv) When slippery surfaces are encountered during patrol	All locations	IA	IA	IA

*Legend: min - minutes, h – hours, d- days, IA – immediate application*

*\* As per time to bare pavement spec.in Section 401.8.1- Highway Snow Plowing.*

**PO8.2.2d**

Compact snow or ice remaining on paved highway surfaces, after snowfalls have ended, and snow removal operations on the travel lanes have been completed, is to be removed within the times specified in Table 401-13:

**Table 401- 13: Compact Snow or Ice Response Times**

Mainline	Ramps	Paved Service Roads and Crossroads
2 d	3 d	6d

*Legend: d- days*

**401.8.2.3 Specific Requirements**

- a) Magnesium chloride shall not be used on any bridge decks.
- b) Minimize the development of slippery surface conditions on the Bypass Infrastructure and facilitate the removal of snow, compact snow and ice by application of winter abrasives and/or chemicals, as appropriate for the location.
- c) Deploy resources to appropriately prioritized locations, such as areas known for the formation of black ice, crash sites, bridge decks and locations known to have the potential to be hazardous and at locations indicated by the road and weather condition forecast.
- d) Monitor road temperatures and condition forecasts through available forecast and information systems and patrols as necessary to support the appropriate pre-weather event deployment of resources.
- e) Acquire and utilize Road Temperature and Condition (RTC) Forecasts, if available, or other applicable methodologies, to determine if a weather event could develop; and, in advance of a forecasted weather event, respond by pre-treating the highway surface with winter abrasives or anti-icing chemicals, as appropriate for the location.
- f) Utilize data from available forecast and information systems and patrols 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.
- g) Utilize Road Weather Information Systems (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.

- h) 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.
- i) Notify and deploy resources in advance of a weather event as required in order that the application of winter abrasives, anti-icing and de-icing chemicals can commence prior to, and during the anticipated weather and surface conditions.

#### **401.8.2.4 Notes**

The Salt Management Plan to be prepared in accordance with Section 401.8.4 [Salt Management Plan] of this Section is an important aspect of Project Co's winter maintenance operation for implementing best salt management practices to protect the environment from the negative impacts of road salts. The plan can be prepared as a stand-alone document or incorporated as part of the Operation and Maintenance Plan.

### **401.8.3 Roadside Snow and Ice Control**

#### **401.8.3.1 Objective**

To protect the Bypass Infrastructure from drifting snow and falling debris, snow and ice; and maintain the roadside free of accumulated snow and ice that may be hazardous for users of the Bypass Infrastructure and/or properties; or threaten the functional integrity of the Bypass Infrastructure.

#### **401.8.3.2 Performance Measures**

##### **Condition**

**PO8.3.2a** No potentially hazardous snow and ice on overhead structures.

**PO8.3.2b** No accumulations of snow and ice to exceed 300 mm in depth below the top of roadside, median barriers or bridge railings.

##### **Response**

**PO8.3.2c** Complete the clearing of snow and ice on the Bypass Infrastructure, commencing from the time snow removal on adjacent highways is completed, within the times shown in Table 401-14

**Table 401-14: Roadside Snow Clearing Response Times**

Location	Mainline and Ramps	Paved Service Roads and Crossroads
Intersections, medians, Railway Crossings and Railway Crossing Approaches	2 d	3 d
Roadside and median barriers	2 d	3 d
Sight Distance obstructions	1 d	3 d

*Legend: h – hours, d- days*

**PO8.3.2d**

Start removing snow from ditches and/or restoring flow in drainage structures, commencing from the time the deficiency was detected by or reported to Project Co, within the times shown in Table 401-15 below:

**Table 401- 15: Ditch Snow Removal Response Times**

Activity	Mainline and Ramps	Paved Service Roads and Crossroads
Remove snow from ditches that is blocking flow and restore flow in drainage Structures	4 h	24 h

*Legend: h – hours, d- days*

**PO8.3.2e**

Snow and ice accumulating on bridges and all other overhead features shall be removed within 8 hours.

**PO8.3.2f**

Vertical clearances to overhead Utilities reduced by snow plowing operations shall be restored within 3 days after completion of the snow plowing operation.

**401.8.3.3 Specific Requirements**

- a) Remove snow and ice encroaching, overhanging or otherwise accumulating above the travel lanes and shoulder tops.
- b) Provide storage requirements for continuing winter maintenance operations.
- c) Remove snow and ice to facilitate drainage.
- d) Obtain permission for snow fence or snow berm erection from private landowners when necessary.
- e) Snow and ice removal from all overhead structures (such as but not limited to bridges and pedestrian overpasses) shall be completed 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.

- f) Protect users of the Bypass Infrastructure from accumulations of snow and ice such as on overhead signs and bridges that have historically affected the travel lanes, or in locations identified by the Ministry.
- g) Winter abrasives shall be in accordance with Section 401.8.2 [Winter Abrasive and Chemical Snow and Ice Control] of this Section.

#### **401.8.3.4 Notes**

Mitigate environmental effects due to the storage and use of de-icing and anti-icing agents. Compliance with operational requirements specified in present and future provincial and federal laws is required.

#### **401.8.4 Salt Management Plan**

The Salt Management Plan should at a minimum be based on the framework as described in the TAC Salt Management Guide (as required by the Road Salt Code of Practice) and support the following principles:

- Safety;
- Environmental protection;
- Continual improvement;
- Fiscal responsibility;
- Efficient transportation system;
- Accountability;
- Measurable progress;
- Agency based;
- Communication; and
- Knowledgeable and skilled workforce.

The plan should be results orientated and fully endorsed by Project Co management team and communicated to their winter maintenance operators. The plan should include as a minimum the following:

- a) INTRODUCTION
  - OVERVIEW
  - PURPOSE
  - FORMAT of the PLAN
  - RESPONSIBILITIES
- b) POLICY CONTEXT
  - ENVIRONMENTAL POLICY
  - WINTER MAINTENANCE POLICY
  - SALT MANAGEMENT POLICY
    - Salt Management Principles
    - Implementation Guidelines

- APPLICATION
- WINTER MAINTENANCE STANDARDS
- IMPLEMENTATION
- c) OPERATIONAL PRACTICES AND STRATEGIES
  - OVERVIEW
  - POLICIES AND PROCEDURES
    - Level of Service
  - FLEET
    - Fleet Allocation
    - Fleet Upgrade
    - Equipment Calibration
  - MATERIALS
    - Material Application
    - Material Storage and Handling
  - STORM RESPONSE
    - Weather Forecasts
    - Road Weather Information Systems (RWIS)
    - Truck Based Pavement Temperature Sensors (Infra-Red Thermometers-IRTs)
    - Snow Drift Management
    - Snow and Ice Control Training
  - SNOW HAULING AND DISPOSAL
    - Snow Hauling and Disposal
  - COMMUNICATION
    - Communications
  - SALT VULNERABLE AREAS
    - Salt Vulnerable Areas
  - RECORD KEEPING
    - Material Use Record Keeping
    - Storm Response Record Keeping
- d) MONITORING
  - OVERVIEW
    - Salt Management Plan Review
    - Winter Maintenance Practices

The plan will include processes to ensure compliance with all environmental laws including obtaining all necessary permits in connection with the services. This includes, but is not limited to using best practices as described in the TAC Salt Management Guide, as required by the Road Salt Code of Practice.

## **401.8.5 Salt Usage Report**

The Salt Usage Report shall provide details on the use of sand, salt and salt substitutes that meets the requirements specified by Environment Canada and the Ministry for environmental monitoring and reporting.

## **401.9 ROADSIDE OPERATION AND MAINTENANCE**

### **401.9.1 Roadside Vegetation and Noxious Weed Control**

#### **401.9.1.1 Objective**

To control vegetation along the road corridor, including trees, brush, weeds and grass in order to ensure visibility and increased safety for users of the Bypass Infrastructure, to control the spread of Noxious Weeds; to ensure effective drainage is not compromised; and to reduce possible fire hazards.

#### **401.9.1.2 Performance Measures**

##### **Condition**

- PO9.1.2a** Ensure vegetation beyond the shoulder edge does not:
- i) Cause sight distance obstructions on curves, intersections of highways, accesses; railway crossings and railway crossing approaches;
  - ii) Obscure the visibility of signs, delineators, animal reflectors, other roadside features or for users of the Bypass Infrastructure; and
  - iii) Impede drainage.
- PO9.1.2b** Noxious Weeds shall be treated prior to the development of seed.
- PO9.1.2c** Upon notification, eradicate all weeds including species identified under the Weed Control Act (Saskatchewan) and the applicable Local Authority's bylaws, or species which interfere or compete with the seeded varieties. Volunteer crops from previous land use will be considered as weeds.
- PO9.1.2d** Prior to vegetation management work on highway rights-of-way, contact residents of "off premise" dwellings within 30 m from the point of application for consent. If consent is not given for selective herbicide application then alternative methods will be employed to control noxious weeds.
- PO9.1.2e** Prior to vegetation management work for brush control on highway rights-of-way, notify adjacent property owners, directly affected communities and the public of projects. Notification will be by advertisements through one or all of the following: local newspapers, radio, flyers and personalized letters.

**PO9.1.2f** Post signage, no less than 48 hours before, at the start and end of each project area indicating vegetation management work and herbicide application.

**PO9.1.2g** Control trees and brush in the vegetation zone when the maximum height of the trees and brush is reached as specified in Table 401-16 below.

**Table 401- 16: Vegetation Zone and Maximum Height**

Location	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
Main Line and Ramps	To limit of right-of-way	2.0 m

**PO9.1.2h** There shall be no vegetation control cuttings that represent a hazard, obstruct drainage or create a nuisance.

**PO9.1.2i** There shall be no vegetation within a 5 meter perimeter of bridges and other structures to facilitate inspections and maintenance.

**PO9.1.2j** Four weeks prior to vegetation management work on specific sites, notify and make available an information package to the appropriate authorities including:

- The local Integrated Resource Manager from Saskatchewan Environment will be contacted.
- Rural municipalities will be contacted where applicable.
- Local communities will be contacted where applicable.

**PO9.1.2k** Ensure that the following information is available to the public:

- Ministry’s Vegetation Management Information brochure
- Specific site locations where herbicide application will take place (including maps, if requested)

**PO9.1.2l** Ensure that an informational package (the “**Informational Package**”) provides the following information:

- Ministry’s Vegetation Management Information brochure;
- Specific site locations where herbicide application will take place (including maps);
- The type and rationale of herbicide selection for each specific site or group of sites;
- Rationale for selecting particular vegetation control methods at each particular site;
- Scheduling of the work; and

- Short term and long term impacts of the vegetation management strategy on the environment and the public.

**PO9.1.2m**

Ensure that vegetation management personnel can provide information to property owners or other concerned parties on the following:

- Protection of off-target vegetation (e.g. drift control, control of fire hazards, etc.);
- Impact on people and wildlife;
- Toxicity levels of herbicides being used;
- Safety precautions of handling the herbicide;
- Alternative methods considered;
- Re-entry period; and
- Other concerns.

**PO9.1.2n**

Ensure that the vegetation management personnel can answer the following questions:

- Describe the control methods being used (including herbicide trade name, active ingredients, and concentration if appropriate); and
- Safety measures (including personal protective equipment, drift control, and control of other hazards):
  - Rationale for vegetation control
  - Re-entry period, if applicable
  - Be able to provide the Ministry contact person

**PO9.1.2o**

Ensure that the vegetation management personnel have reviewed the Informational Package distributed by the Ministry prior to working on the site.

**PO9.1.2p**

Remove signage from the site no sooner than 48 hours after the herbicide application is completed. Signage may be left up longer depending on recommendations from the herbicide manufacture; but shall be removed within the season of application.

**PO9.1.2q**

Review the quality of the work, upon completion.

**PO9.1.2r**

Any method of weed control adopted by Project Co shall take into account wind directions and velocities. Project Co shall ensure that residents located near the Bypass Infrastructure are not subjected to dust and/or spray drift resulting from its weed control operations. Natural areas shall not be subjected to spray drift. Project Co shall be responsible for all costs associated with any damage to residential property, natural areas or retained plant materials resulting from spray drift or poor agricultural or weed control practices carried out by or for Project Co.



**PO9.1.2s** As per Saskatchewan’s regulations, all pesticide applicators shall hold an industrial applicator’s licence for pesticide use.

**401.9.1.3 Specific Requirements**

- a) Control vegetation from the shoulder edge to the edge of the pavement in accordance with Section 401.6.2 [Highway Shoulder Maintenance] of this Section.
- b) Mow to the lowest possible height given the terrain, using an industry standard mower.
- c) Control vegetation as necessary to reduce winter icing problems.
- d) Remove and control vegetation that obstructs drainage in accordance with Section 401.7.1 [Ditch and Watercourse Maintenance] of this Section.

**401.9.1.4 Notes**

Project Co shall be responsible for any fines or weed control notices. All notices shall be dealt as specified in Project Co’s communication plan. Copies of all fines and notices shall be provided to the Ministry.

**401.9.2 Litter Collection and Graffiti Removal**

**401.9.2.1 Objective**

To keep the Bypass Infrastructure and associated facilities clean and tidy for public users by the safe and efficient collection and disposal of litter, which is greater than 100 mm in least dimension or is visible from the roadway, and the treating of graffiti.

**401.9.2.2 Performance Measures**

**Condition**

There are no condition measures for this specification.

**Response**

**PO9.2.2a** During the summer months, litter shall be collected in compliance with the minimum litter collection frequencies specified in Table 401-17:

**Table 401- 17: Litter Collection Frequencies**

<b>Location</b>	<b>Minimum Frequency</b>
Mainline and Ramps	every 30 d
Paved Service Roads and Crossroads	every 60 d

*Legend: d- days, m-months*

**PO9.2.2b** Graffiti shall be removed or covered within the times listed in Table 401-18.

**Table 401- 18: Graffiti Removal Response Times**

Location	Response Times
Mainline and Ramps	3 d
Paved Service Roads and Crossroads	7 d

*Legend: d- days*

**401.9.2.3 Specific Requirements**

- a) Graffiti on natural features and Bypass Infrastructure inventory should be removed or covered 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.
- b) Report vehicles or equipment abandoned on the Bypass Infrastructure to the applicable Police.

**401.9.3 Roadside Fence Maintenance**

**401.9.3.1 Objective**

To prevent wildlife, livestock and pedestrians from entering onto the Bypass Infrastructure and restore the functionality of specialty fences.

**401.9.3.2 Performance Measures**

**Condition**

**PO9.3.2a** If wildlife or livestock is present on the Bypass Infrastructure, provide initial traffic control in accordance with Section 401.10.10 [Highway Traffic Control] of this Section until Police or livestock owners arrive at the scene.

**Response**

**PO9.3.2b** Start repairs within 24 hours to fences along the Bypass Infrastructure where the damage is the result of one of the following:

- i) Motor vehicle crashes;
- ii) Acts of vandalism;
- iii) Fallen trees from the Bypass Infrastructure;
- iv) Slides, fire, flood; or
- v) Other natural occurrences.

**PO9.3.2c** Complete repairs to all fences along the Bypass Infrastructure within 7 days.

**PO9.3.2d** Commence repairs to specialty fences, when the repair is of a safety related nature, within 1 hour and complete repairs within 7 days

#### **401.9.3.3 Specific Requirements**

Project Co shall make permanent repairs to or construct new specialty fences to restore their functionality and repair all fences consistent with the existing type of fence or as approved in writing by the Ministry.

#### **401.9.4 Mowing**

##### **401.9.4.1 Objective**

To provide aesthetically pleasing areas of grass, through the appropriate level of maintenance.

##### **401.9.4.2 Performance Measures**

Project Co shall maintain healthy, high quality grass as follows.

#### **Condition**

##### **Mainline and Ramps:**

**PO9.4.2a** Grass will be mowed to a maximum height of 150mm for a distance of 4m on either side of the roadway between June 1<sup>st</sup> and July 15<sup>th</sup>.

**PO9.4.2b** Grass will be mowed to a maximum height of 150mm from edge of right-of-way to edge of right-of-way between July 15 and October 1.

**PO9.4.2c** At least 2 weeks shall pass between the first and second mowing of the same area.

##### **Paved Service Roads and Crossroads:**

**PO9.4.2d** Grass will be mowed for a distance of 4m on either side of the roadway between June 1 and July 15.

**PO9.4.2e** Grass will be mowed from edge of right-of-way to edge of right-of-way between July 15 and October 1.

**PO9.4.2f** At least 2 weeks shall pass between the first and second mowing of the same area.

#### **401.9.4.3 Specific Requirements**

- a) Project Co shall ensure that mowing is done in such a manner as to not leave wheel depressions or other damage to the grass areas.
- b) No refuse, including litter, shall remain at the end of the day's mowing operation.
- c) Project Co shall not allow anyone to salvage hay with the right-of-way.

#### **401.9.5 Access Control Operation**

##### **401.9.5.1 Objective**

To monitor and coordinate access control operations along the Bypass Infrastructure on behalf of the Ministry

##### **401.9.5.2 Performance Measures**

#### **Condition**

There are no condition measures for this specification.

#### **Response**

**PO9.5.2a** Monitor and remove any illegal access points to the highway.

##### **401.9.5.3 Notes**

Access onto any controlled access highway is restricted to the designated access points. Therefore Project Co shall not permit any access contravening that status.

#### **401.9.6 Noise Barrier**

##### **401.9.6.1 Objective**

To keep noise barriers safe, clean, tidy and functional to reduce noise levels as designed

##### **401.9.6.2 Performance Measures**

#### **Condition**

##### **PO9.6.2a**

All noise barriers which have shifted or moved out of original location are realigned within seven (7) days upon detection or being made aware.

P09.6.2c The vertical alignment of all noise barriers shall not differ by more than 50 mm/linear metre from vertical.

P09.6.2d All noise barriers or part thereof shall meet the acoustic and aesthetic design requirements specified elsewhere in this Project Agreement.

**Response**

P09.6.2e All components that contain moving parts are cleaned and maintained in accordance with the manufacturer's recommendations and Good Industry Practice by June 1 every year.

**401.9.6.3 Specific Requirements**

Project Co shall make permanent repairs to or construct new noise barrier to restore their functionality and repair all noise barrier consistent with the existing type of noise barrier or as approved in writing by the Ministry

**401.10 TRAFFIC OPERATION AND MAINTENANCE**

**401.10.1 Traffic Signs Systems**

**401.10.1.1 Objective**

To ensure that signs are maintained to a high standard.

**401.10.1.2 Performance Measures**

**PO10.1.2a** Any regulatory or warning signs that are not visible at night from a distance of 160 m, with head lights on dipped beam shall be replaced within 7 days.

**PO10.1.2b** Any signs whose message is illegible in daytime shall be replaced within 7 days.

**PO10.1.2c** Any signs that are spray painted or vandalized shall be replaced within 7 days.

**PO10.1.2d** Any sign that has major damage to the sign substrate shall be replaced within 7 days.

**PO10.1.2e** Any sign which does not meet the minimum reflectivity level specified in Table 401-19 shall be replaced within 14 days.

**Table 401-19: Minimum Maintained Retroreflectivity Levels**

Sign Colour	Location	Sheeting Type (ASTM D4956)
		IX
White on Green	Overhead	250//25
	Shoulder	120//15

Notes:

Levels in table represent legend retroreflectivity // background retroreflectivity (for positive contrast signs). Units are cd/lx/m<sup>2</sup> measured at an observation angle of 0.2 and an entrance angle of -4.0

**401.10.1.3 Specific Requirements**

- a) Signs and associated equipment operate in accordance with their intended design and performance.
- b) The reflectivity of all white on green signs shall be measured beginning 10 years after installation and every 2 years subsequent.
- c) Identification markers are provided, correctly located, visible, clean and legible.

**401.10.2 Sign System Maintenance**

**401.10.2.1 Objective**

To regulate and facilitate the safe and orderly movement of traffic by use of a signage system that is in good working order, clean and visible, unambiguous and complete and safely installed.

**401.10.2.2 Performance Measures**

**Condition**

**PO10.2.2a** Sign systems that are knocked or blown down are to be reset.

**PO10.2.2b** Illegal or unauthorized signs including election signs unless they meet the requirements of *The Provincial Highway Sign Control Regulations* or sign systems on the Bypass Infrastructure are to be removed within 24 hours of discovery..

**PO10.2.2c** Ensure all sign face overlays, signs and sign systems, including posts and battens, post mounted delineators, reflectors and other delineators are fully compliant with the specified materials clauses below.

**Response**

**PO10.2.2d** Use Table 401-20 to establish the maximum time within which Project Co shall complete the cleaning, resetting, repair, and/or relocation of sign systems, reflectors and post mounted delineators:

**Table 401- 20: Sign Maintenance Response Times**

<b>Type of Sign marking (In accordance with the Saskatchewan Traffic Control Devices Manual )</b>	<b>Mainline and Ramps</b>	<b>Paved Service Roads and Crossroads</b>
(i) Regulatory and warning	24 h	24 h
(ii) School and pedestrian	24 h	2 d
(iii) Delineators and post mounted delineators	24 h	2 d
(iv) Parking and stopping	24 h	2 d
(v) Guardrail reflectors	7d	7 d
(vi) Animal reflectors	24 h	2 d
(vii) Direction (guide)	2 d	3 d
(viii) Information	2 d	3 d
(ix) Service and attraction	2 d	3 d
(x) All other signs and surface reflectors	7 d	7 d

*Legend: h - hours, d – days*

**PO10.2.2e** In addition to PO10.2.2d, make temporary repairs to any regulatory or warning sign that is determined to be a damaged sign as described in the specific requirements below or if any stop or yield sign is missing; and initiate installation of temporary signage or provide traffic control in accordance with Section 401.10.10 [Highway Traffic Control] of this Section immediately.

**PO10.2.2f** Sign systems and post mounted delineators required to be removed and reinstalled due to policy changes or to seasonal requirements or changing needs or conditions, at those locations determined by the Ministry; shall be relocated within 7 days of defect identification.

**PO10.2.2g** Regulatory, warning or school and pedestrian sign face overlays, signs and/or sign systems shall be replaced or installed within 24 hours of defect identification.

**PO10.2.2h** New or replacement guide or information sign face overlays, signs and/or sign systems are to be installed within 24 hours of delivery.

**PO10.2.2i** Delineators and all other sign face overlays, signs and/or sign systems shall be installed within 7 days of any major defect identification.

**PO10.2.2j** Replace, touch up or re-paint all sign and flexible delineator posts when the surface is discoloured or damaged.

### **401.10.2.3 Specific Requirements**

- a) Signs shall not be mounted on poles or structures without the prior approval of the Ministry and/or the owner of the poles or structures.
- b) Keep all sign systems and post mounted delineators clean, legible, adequately reflectorized, erect and correctly located in accordance with the *Saskatchewan Traffic Control Devices Manual*, or as otherwise specified by the Ministry.
- c) Additional details regarding sign system material requirements are as follows:
  - Sign face overlays, signs and sign systems shall be as specified in the *Saskatchewan Traffic Control Devices Manual*.
  - Metal posts and battens are made of perforated, galvanized steel square tubing or of other material as approved in writing by the Ministry.
  - All wooden posts and battens are pressure-treated wood surfaced 4 sides (S4S), with dimensions, colour and shape as specified in the Technical Requirements.
  - Flexible delineators are as specified in the *Saskatchewan Traffic Control Devices Manual* and that plastic or fibreglass delineator posts are in accordance with in the Technical Requirements.
  - Oil-base, solid colour stain or oil-base exterior paint, compatible primer paint and standard paint colours are as specified in the *Saskatchewan Traffic Control Devices Manual*, with all materials meeting specifications as to quality, coverage and colour in accordance with the Technical Requirements.
  - All hardware is of non-corrosive material to avoid discolouration of sign and delineator faces.
  - Delineator reflectors and reflective sheeting are in accordance with the *Saskatchewan Traffic Control Devices Manual*.
  - Concrete and other materials used for production and fabrication of sign bases are in accordance with *Saskatchewan Traffic Control Devices Manual*, or in the Technical Requirements.
  - Post mounted delineators, animal reflectors and other materials are as in the Technical Requirements.
  - Replace reflectors with the same type, size and quality as existing and in accordance with the *Saskatchewan Traffic Control Devices Manual*.
  - Obtain prior approval from the Ministry for all re-ordering and design of guide signs and special information signs.
  - Guardrail reflectors are as specified in the Technical Requirements.
- d) The Ministry's policy for highway signs is described as follows:
  - Poorly maintained signs and other sign systems reduce highway safety and spoil the appearance of an otherwise well maintained highway. To be respected by users of the Bypass Infrastructure and to be useful and effective, Sign systems shall be correctly used and correctly placed.
  - Effective signing requires:



- Selection of the correct sign system for a particular situation;
  - Correct location of the sign system; and
  - Ongoing maintenance to ensure that the sign and its post(s) are in good condition.
- In order to meet the requirements of the *Saskatchewan Traffic Control Devices Manual*, Project Co shall 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 Project Co shall carry out its obligations in accordance with this Section in a manner that minimizes the overall deterioration of signs and other sign systems.
- e) The following is a description of “**Sign Deterioration**” for the purposes of this Section:
- 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 shall 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; and
  - 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 overrides the ability of the sign text, colour, or legend to be effectively presented to users of the Bypass Infrastructure or other intended audience.
- f) A sign is considered to be a “**Damaged Sign**” for the purposes of this Section, when:
- The sign is not flat (planar) and properly oriented to the travelling public or other intended audience;
  - Either 10 cm<sup>2</sup> or 1% (whichever is greater) of the sign face area is damaged, dented, vandalized or otherwise not as new; or
  - The intended message to users of the Bypass Infrastructure or other intended audience is unclear or confusing.

### **401.10.3 Pavement Marking**

#### **401.10.3.1 Objective**

To facilitate the safe and orderly movement of traffic by the use of clearly visible, unambiguous and correct line marking to assist users of the Bypass Infrastructure.

### 401.10.3.2 Performance Measures

#### Condition

- PO10.3.2a** When viewed dry or wet in the daytime, pavement markings shall be readily visible for a forward distance of 150 m, or as far forward as possible until obstructed by the road geometry if less than 150 m.
- PO10.3.2b** Ensure the night time retro-reflectivity of a longitudinal marking or any other marking under dry conditions shall exceed:  
150 millicandela•m<sup>-2</sup>•lux<sup>-1</sup> for yellow markings; and  
200 millicandela•m<sup>-2</sup>•lux<sup>-1</sup> for white markings.
- PO10.3.2c** Ensure the night time retro-reflectivity of a thermoplastic longitudinal marking or any other thermoplastic marking under dry conditions shall exceed:  
100 millicandela•m<sup>-2</sup>•lux<sup>-1</sup> for yellow markings; and  
180 millicandela•m<sup>-2</sup>•lux<sup>-1</sup> for white markings
- PO10.3.2d** There shall be no longitudinal markings where the length of defective longitudinal marking within a 300 m segment exceeds:
- i) 36 m continuous or 25% of total on any 300 m lane length on curves and barrier lines; and tangent sections less than 300 m, or
  - ii) 75 m continuous or 50% of total on any 300 m or greater lane length on tangents.
- PO10.3.2e** Maintain well-defined pavement marking line edges which are free of lateral deviations greater than 10 mm from the proposed location alignment as specified in the *Saskatchewan Traffic Control Devices Manual* or as directed by the Ministry.
- PO10.3.2f** There shall be no transverse markings or other pavement markings where the marking has lost its meaning or more than 25% of the marking is defective, or the marking is missing a contiguous area equal to or greater than 500 cm<sup>2</sup>.
- PO10.3.2g** Ensure pavement marking lines respect the following tolerances as listed in Table 401-21.

**Table 401- 21: Line Marking Tolerances**

Specified Line Width	Tolerance
100 mm Specified Line Width	-5 mm to +10 mm
200 mm Specified Line Width	-10 mm to +10 mm

- PO10.3.2h** Ensure pavement marking direction dividing, lane dividing or continuity lines do not exceed a maximum dimensional length deviation of +/-100 mm from existing lengths of line.
- PO10.3.2i** Keep spacing between painted direction dividing, lane dividing or continuity lines within a maximum length deviation of +/-100 mm from existing lengths of space.
- PO10.3.2j** Pavement markings are not placed within 300 mm of roadway markers.
- PO10.3.2k** Comply with U.S. Federal specification 595b White 17886 for the colour of white pavement markings.
- PO10.3.2l** Comply with the tolerances outlined in Table 401-22 below, using a CIELAB colour scale (595b yellow 33538), for the colour of yellow pavement markings. CIELAB is defined in ASTM D2244.

**Table 401- 22: Yellow Traffic Paint Colour**

	<b>L</b>	<b>a</b>	<b>b</b>
Standard	78.94	7.76	71.93
Maximum	80.94	10.76	77.93
Minimum	76.94	6.26	70.43

*Note: Readings taken with Minolta CR-231 or CR-221 colour meter.*

- PO10.3.2m** Apply thermoplastic material at a minimum finished thickness of 3 mm and a maximum finished thickness of 5 mm.
- PO10.3.2n** Ensure that all pavement markings have a skid resistance of greater than 45 British Pendulum Number (BPN) units at any temperature.
- PO10.3.2o** Ensure pavement markings applied with thermoplastic materials have a minimum durability of 2 years from the time of application.
- PO10.3.2p** Pavement markings shall be not less than the photographic reference standard of 92% as per ASTM D913.

## Response

**PO10.3.2g** Repair pavement markings within 3 months of discovering non-compliance with any of the above condition measures.

**PO10.3.2r** Testing is to be undertaken as a minimum twice annually, once after April 15 and again before September 15 to ensure compliance with the outcomes specified and is to be conducted in accordance with the applicable ASTM standards and the Manual of Standard Traffic Signs and Pavement Markings.

**PO10.3.2s** Test initial applications of pavement markings or re-application of pavement markings within 30 days of application.

### **401.10.3.3 Specific Requirements**

- a) Pavement markings lines are to be straight or of uniform curvature and conform with the tangents, curves, and transitions as specified in the Manual of Standard Traffic Signs and Pavement Markings or as directed by the Ministry.
- b) Paint lane lines, continuity lines and edges lines on tangent section of constant width, straight and parallel to each other to maintain their correct offset from the edge of the pavement and from one another.
- c) Pavement markings shall be placed to delineate changes in the number of lanes, variations in roadway width or adjustments in lane width are straight and true.
- d) Paint pavement markings placed on curves to accurately follow the change in direction prescribed by the roadway. Transition from adjacent tangent sections shall occur smoothly and at a constant rate over the specified distance.
- e) Ensure pavement markings always maintain the specified lane width.
- f) Ensure pavement markings have a sufficiently thick cross-section throughout their entire length to completely cover the intended area being marked.
- g) Apply pavement marking for the full length of all ramps, gores and traffic islands where sufficient lane widths exist.
- h) Ensure pavement markings are free of splatter, excessive overspray or other defects and that overspray on roadway markers is avoided.
- i) Remove all thermoplastic materials that are not bound to the pavement before new thermoplastic materials are applied for repair or replacement.

### **401.10.4 Temporary Line Marking and Eradication**

#### **401.10.4.1 Objective**

To facilitate the safe and orderly movement of traffic by the use of clearly visible, unambiguous and correct temporary line marking, as and when required to assist users of the Bypass Infrastructure.

#### **401.10.4.2 Performance Measures**

##### **Condition**

- PO10.4.2a** No line markings which are superfluous or obsolete or as directed by the Ministry.
- PO10.4.2b** The surface shall not be damaged as a result of any grinding or other eradication technique used to remove temporary line markings.
- PO10.4.2c** All pavement marking materials residue shall be removed and disposed of in a manner acceptable to Local Authorities.

##### **Response**

- PO10.4.2d** Place temporary line markings immediately 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 potentially hazardous.
- PO10.4.2e** When temporary line markings are required as a consequence of Project Co's provision of maintenance services, place temporary line markings and eradicate temporary and permanent line markings within 3 hours of completing such maintenance services.
- PO10.4.2f** Ensure that temporary line markings bond to the surface and will last for up to 1 month or until the permanent markings are applied.

#### **401.10.4.3 Specific Requirements**

All temporary line markings are to be in accordance with the Manual of Standard Traffic Signs and Pavement Markings.

#### **401.10.5 Post Mounted Delineators**

##### **401.10.5.1 Objective**

To maintain and replace post mounted delineators.

##### **401.10.5.2 Performance Measures**

##### **Condition**

- PO10.5.2a** Project Co shall supply and install post mounted delineators on open shoulder sections.
- PO10.5.2b** Reflectors with ASTM Type 9 sheeting shall be used.

## **401.10.6 Reflectors on Barriers**

### **401.10.6.1 Objective**

To maintain and replace reflectors on barriers.

### **401.10.6.2 Performance Measures**

#### **Condition**

**PO10.6.2a** Reflectors shall be mounted on top of barriers and only reflectors designed for top mounting shall be used.

**PO10.6.2b** Spacing for reflectors is 12.5 m on median barrier, and 25.0 m on roadside barrier.

## **401.10.7 Electrical Infrastructure**

### **401.10.7.1 Objective**

To manage the serviceability and maintenance aspects of the electrical systems consistent with the standards and service levels as delivered to the provincial network and to maintain the electrical system assets to achieve the desired levels of service and limit the extent of asset consumption over the Operational Term.

### **401.10.7.2 Performance Measures**

#### **Response**

**PO10.7.2a** Respond by a qualified electrical personnel, to diagnose problems and begin repairs, is required within 24 hours of outages in a conventional system being identified. The deficient equipment shall be made operable within 48 hours of the deficiency being discovered.

Respond by qualified electrical personnel, to diagnose problem and begin repairs, is required within 24 hours of the outage of luminaires on a high-mast pole assemblies being discovered. The deficient equipment shall be made operable within 48 hours of the deficiency being discovered.

#### **Condition**

**PO10.7.2b** Ministry standards and submitted pursuant to Schedule 9 - Review Procedure prior to any alteration being made.

**PO10.7.2c** Lightning Protection - comply with any operating instructions and maintenance specifications as directed in CAN/CSA-B72-M87 (R2013).

**PO10.7.2d** Maintain Uninterruptable Power Supply (UPS) - Repair or replace uninterruptable power supplies and their components, including batteries, in conformance with manufacturers' recommendations. Batteries shall be replaced when their charge falls below 80% of their rated capacity;

#### **401.10.7.3 Specific Requirements**

- a) After opening of the Bypass Infrastructure to general traffic, Project Co shall review the traffic signal operations at all intersections within provincial jurisdiction 1 week, 1 month, 6 months and annually thereafter. Updated signal timing sheets and supporting analysis shall be submitted to the Ministry in accordance with Schedule 9 - Review Procedure whenever signal timings are to be adjusted.
- b) Undertake a complete inspection of all components of the system to determine actual or potential failure to components, once every 2 years.
- c) Undertake an internal inspection of the substation and kiosks once every 6 months to assure that internal illumination is in good operating condition, floors are clean and electrical switchgear and controls are in good operating condition. Power supply (transformers and control equipment) shall also be inspected at this time to ensure proper functioning of the power supply devices. The inspection shall also include a visual examination of all cable and conduits for any damage.
- d) Undertake an external inspection of the substation and kiosks once every month to ensure that hazardous conditions do not exist (e.g. vegetation, vandalism, unlocked doors, perforations etc.). Painted surfaces shall be inspected for deficiencies.
- e) Every 2 years, ensure all poles and luminaires shall be free of cracks, rust and physical defects. Any spalling conditions or cracks affecting the structural integrity of the pole or concrete base shall be repaired within 20 days of deficiency being discovered.
- f) Ensure that all luminaires are in proper alignment and poles vertically erect in accordance with this Schedule. Any instances of improper alignment shall be corrected within 5 days of deficiency being discovered.
- g) Ensure that all unprotected concrete foundations within the clear zone shall not project above the rounding or foreslope by more than 100 mm. Repairs shall be made within 20 days of discovery.
- h) Check for outages, during night-time patrols for outages at least once per week. Ensure that internal substation structures are:
  - Relatively free of dust, dirt, debris, oil and grease;
  - Secured with properly functioning locking devices; and
  - Properly lit with standard electrical lights. Any deficiency shall be corrected within 5 days. If the security of the substation is jeopardized the deficiency shall be corrected within 8 hours.
- i) Ensure that electrical switchgear equipment and controls are in proper operating condition at all times.
- j) Externally, substation structures shall be:
  - Free of weed and vegetation matter;
  - Free of litter and Debris; and

- Secured with fencing and proper functioning locking devices on fence gates. Any deficiency shall be corrected within 5 days. If the security of the substation is jeopardized the deficiency shall be corrected within 8 hours.
- k) Ensure that painted surfaces, internally and externally, shall be free of chipping and flaking. Evidence of chipping and flaking or the accumulation of rust shall be within 30 days.
- l) Ensure transformers are in proper operating condition. Coolant fluids shall be kept at proper levels. Spills of transformer fluids shall be cleaned up within 4 hours of discovery.
- m) Project Co shall verify annually the signal warrants for any unsignalized intersection within the Road Right of Way using the procedures outlined by the new method in the *TAC Traffic Signal Warrant Handbook* which applies the *Canadian Traffic Signal Warrant Matrix Procedure*. Project Co shall submit the warrant calculations to the Ministry as soon as practicable after verification.

#### **401.10.8 Power Distribution**

##### **401.10.8.1 Objective**

To ensure a continuous supply of electrical power from Sask Power.

##### **401.10.8.2 Specific Requirements**

- a) Coordinate all required services;
- b) Provide a list of electrical loads as required; and
- c) Project Co shall be responsible for all costs to supply electricity to facilities located within the Bypass Infrastructure in accordance with Section 200.6.2 Utilities of this Schedule [Utilities].

#### **401.10.9 Traffic Monitoring Equipment**

##### **401.10.9.1 Objective**

To ensure the continuous operation of traffic monitoring equipment that is used to collect accurate traffic data throughout the Bypass Infrastructure corridor. The Ministry shall be able to retrieve the traffic count data electronically and in a format compatible with the Ministry's corporate Traffic Data Management Program, both during the Term and thereafter, with a 12 month retention period.

##### **401.10.9.2 Specific Requirements**

Project Co shall be responsible for all installation, operational and maintenance costs associated with the Bypass Infrastructure's traffic monitoring equipment.



### **401.10.10 Highway Traffic Control**

#### **401.10.10.1 Objective**

To keep the Bypass Infrastructure safe and to minimize delays for, and advise users of the Bypass Infrastructure of the duration and cause of delays.

#### **401.10.10.2 Performance Measures**

##### **Condition**

**PO10.10.2a** Perform the traffic control in accordance with the *Saskatchewan Traffic Control Devices Manual for Work Zones*.

##### **Response**

**PO10.10.2b** Project Co shall perform traffic control immediately, for the following situations:

- i) In response to all situations on the Bypass Infrastructure that are potentially hazardous or request a closure of the Bypass Infrastructure, as appropriate; and
- ii) Complete closures of the Bypass Infrastructure.

**PO10.10.2c** Where traffic flow is restricted due to the operations of Project Co and the delay exceeds 15 minutes, adjust the operations or terminate work until the traffic volume eases.

#### **401.10.10.3 Specific Requirements**

Utilize the *Saskatchewan Traffic Control Devices Manual for Work Zones* 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.

### **401.10.11 Permitting**

#### **401.10.11.1 Objective**

To cooperate with the Ministry in regards to permitting; thereby, partnering to assist the Ministry with ensuring that economic routes including the Bypass are reliable and efficient and enable a strong and growing Saskatchewan.

#### **401.10.11.2 Specific Requirements**

Project Co acknowledges that the Ministry retains the right to authorize the issuance of permits.

The Ministry may issue permits for activities within, under, and over the right-of-way and adjacent to the right-of-way over the life of the Project Term including but not limited to the following types of permits:

- a) Overweight/Over dimensional permits;
- b) Crown Utility permits;
- c) Private Utility permits;
- d) Roadside development permits;
- e) Special event permits for such things as races and parades;
- f) Utility repair permits;
- g) Signing permits;
- h) Access control permits; and
- i) Subdivision applications.

The Ministry will notify Project Co of any permit requests and will reasonably consult and coordinate permit evaluations with Project Co.

#### Over Weight Loads

Project Co acknowledges that the Ministry retains the right to authorize the issuance of single trip, and multiple trip bulk haul overweight load permits for vehicles having a similar load effect to those load configurations already assessed by Project Co pursuant to Section 200.7.2.1 of Schedule 15-2 – Design and Construction. The Ministry may authorize annual permits based on the single trip limits provided by Project Co, but further reduced by the ratio of the “PS” live load factors divided by the “PA” live load factors from the Bridge Design Code.

The Ministry may request Project Co to undertake additional bridge load evaluation analysis and recommendations for specific non-typical overweight load configurations which may request to cross bridges with or without controls and conditions, such as, speed reduction or by controlling the position of the vehicle when crossing the bridge. The Ministry will require Project Co to work with the carrier of the specific non-typical over weight load and to provide recommendations to the Ministry as to the feasibility of allowing the overweight vehicle to traverse the bridge(s) within 5 Business Days of reaching agreement of the payment terms with the carrier. The costs of this additional evaluation and traffic accommodation for the non-typical overweight vehicle will be the responsibility of the carrier.

Project Co shall act reasonably when making recommendations to the Ministry for the accommodation of any overweight load as a result of its evaluation. The Ministry will either:

- 1) Seek clarification from Project Co in relation to the recommendations including requiring Project Co to carry out further analysis in consultation with the carrier; or
- 2) Request that Project Co amends the recommendations.

Once the Ministry and Project Co agree on the recommendations, the Ministry will require that the recommendations are made conditional to the issuance of an overweight permit to the carrier-

If the Parties fail to agree with the recommendations then either Party may refer the matter to the Dispute Resolution Procedure.

The issuance by the Ministry of any permit shall not derogate from or otherwise relieve Project Co of its obligations pursuant to the Project Agreement.

#### **401.10.12 Permitting**

##### **401.10.12.1 Objective**

To ensure the functionality of the ITS application and specialized software and the ITS Infrastructure in the field.

##### **401.10.12.2 Specific Requirements**

The ITS application and specialized software and the ITS Infrastructure in the field shall be operated, maintained, and rehabilitated to maintain functionality and to meet the requirements as described in Schedule 15-2, Technical Requirements, Appendix F – Intelligent Transportation Systems.

#### **401.11 BRIDGE AND STRUCTURE MAINTENANCE**

##### **401.11.1 Highway Structures Maintenance**

##### **401.11.1.1 Objective**

To provide a safe environment for users of the Bypass Infrastructure and to maximize the functional life of the Bridge Structures by way of regular and efficient inspection, maintenance, rehabilitation, repair, cleaning and replacement.

##### **401.11.1.2 Performance Measures**

##### **Condition**

There are no condition measures for this specification.

##### **Response**

**PO11.1.2a** Repair, clean and restore to a fully functional condition, any damaged or deteriorated Bridge Structures within the maximum times shown in Table 401-23.

**Table 401-23: Structure Maintenance Response**

Maintenance Requirement	Mainline	Ramps	Paved Service Roads and Crossroads
Walls requiring patching or support	10 d	20 d	30 d
Sand accumulations on Underpass floors	30 d	2 m	3 m

*Legend: h – hours, d – days, m – months*

**401.11.1.3 Specific Requirements**

- a) Underpass walls are to be maintained in a uniformly-painted condition using paint materials of an appropriate colour in a manner to minimize the aesthetic impacts of the repair and in accordance with the paint manufacturer’s specifications.
- b) Concrete highway structures are to be maintained in accordance with Section 401.11.8 [Concrete Structure Maintenance] of this Section.
- c) Steel and aluminum structures are to be maintained in accordance with Section 401.11.9 [Steel and Aluminum Structure Maintenance] of this Section.
- d) Bridge pilings and trash racks are to be maintained in accordance with Section 401.11.10 [Bridge Piling and Trash Rack Maintenance] of this Section.
- e) Retaining structures are to be maintained in accordance with Section 401.11.11 [Retaining Structure Maintenance] of this Section.
- f) Corrugated steel highway Structures are to be maintained in accordance with Section 401.11.12 [Multiplate Structure Maintenance] of this Section.
- g) Asphalt components of highway Structures are to be maintained in accordance with Section 401.6.1 [Highway Pavement Maintenance] of this Section.

**401.11.2 Bridge Deck Maintenance**

**401.11.2.1 Objective**

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

**401.11.2.2 Performance Measures**

**Condition**

There are no condition measures for this specification.

**Response**

**PO11.2.2a** Complete the temporary repair of the following deficiencies within the maximum times shown in Table 401-24.

**Table 401-24 Temporary Bridge Deck Repair Response Times**

Deck Deficiency	Mainline	Ramps	Paved Service Roads and Crossroads
a) Pot-holes in concrete and asphalt decks			
- travel lane	24 h	24 h	3d
- remainder of deck	3 d	3 d	10 d
b) Membrane deficiencies	2 d	7 d	2 m

*Legend: h – hours, d – days, m – months*

**PO11.2.2b** Permanent repairs to deteriorated concrete and asphalt bridge deck systems are to be completed within 6 months.

**401.11.2.3 Specific Requirements**

- a) Ensure the bridge deck systems meet the following condition requirements:
  - Smooth and safe wearing surface;
  - Repaired area is not to be restricted to visibly deteriorated area;
  - Concrete deck repairs are to be sound, durable and well bonded to the prepared surface;
  - Concrete patch finish is to be tined or broomed;
  - All concrete bridge deck cracks greater than 0.2 mm shall be sealed to a minimum depth of 6 mm with a slow gravity feed of recognized repair material to maximize penetration.;
  - Patch or crack repair is to match existing deck profile; and
  - Bridge deck systems are to be securely fastened or bonded to the support structure.
- b) Complete permanent repairs to the bridge deck systems in accordance with this Section and the manufacturer’s specifications, including but not limited to concrete restoration and concrete crack sealing.
- c) Repair or replace asphalt wearing surfaces in accordance with Section 401.6.1 [Highway Pavement Maintenance] of this Section. Where the intent of the overlay is to provide a waterproofing layer, a pre-fabricated membrane shall be applied first.

**401.11.3 Bridge and Structure Cleaning**

**401.11.3.1 Objective**

To preserve the bridges and structures; and to remove dirt, debris, and deleterious materials that are potentially hazardous for users of the Bypass Infrastructure and to maximize the functional life of the structure.

### 401.11.3.2 Performance Measures

#### Condition

**PO11.3.2a** Railings and truss members are to be cleaned to a minimum height of 3m above the deck surface.

#### Response

**PO11.3.2b** All surfaces (horizontal and vertical) on bridges, structures and associated components including deck, exterior face of girders, bearing seats, deck overhang and curbs, or any other splash zones, are to be cleaned annually.

**PO11.3.2c** Complete the cleaning to the following bridge decks and sidewalks/cycleways in order to remove dirt, debris, and deleterious materials that are potentially hazardous for users of the Bypass Infrastructure within the maximum times shown in Table 401-25.

**Table 401-25 Structure Cleaning Timing and Frequency**

Deck and Sidewalk Locations	Time To Complete
All Structures	Once per year before June 30

**PO11.3.2d** Structures shall be immediately cleaned when conditions are of an urgent nature such as, but not limited to, storms, debris accumulation and/or crashes.

**PO11.3.2e** Clean and remove foreign objects from any surfaces where free drainage of the surface is impaired or where they cause moisture retention on surfaces, within 14 days.

### 401.11.3.3 Specific Requirements

- a) Structure surface cleaning shall be completed 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 authorities, or by June 30 of each year, whichever comes first.
- b) Project Co shall not perform Structure cleaning when air temperatures are 0° Celsius or less, or when such air temperatures are anticipated within 24 hours.

### 401.11.4 Bridge Drain and Flume Maintenance

#### 401.11.4.1 Objective

To provide effective drainage that carries water away as quickly as possible from bridge decks, superstructures, substructures and foundations to prevent damage.

#### **401.11.4.2 Performance Measures**

##### **Condition**

**PO11.4.2a** There shall be no clogged catchment areas.

**PO11.4.2b** Ensure flumes can carry water from drain pipes down fill slopes and away from bridge abutment fills and wing walls.

##### **Response**

**PO11.4.2c** Any clogged drains, catchbasins, steel grill or drain pipe that causes ponding on bridge decks shall be cleaned and unplugged within 1 hour.

**PO11.4.2d** Any grills, drains, catchbasins, drain pipes or flumes that are plugged, but do not cause ponding on bridge decks shall be unplugged within 14 days.

**PO11.4.2e** Complete repair, replacement or anchoring of damaged, missing or loose grills, drains, catchbasins, drain pipes or flumes within 14 days or immediately if they are potentially hazardous.

#### **401.11.4.3 Specific Requirements**

Inspect grills, drains, catchbasins, drain pipes and flumes monthly, or more frequently if required, to identify drainage problems in areas that historically have frequently plugged drains.

#### **401.11.5 Bridge Joint Maintenance**

##### **401.11.5.1 Objective**

To provide a safe, smooth and stable condition for users of the Bypass Infrastructure and to maximize the functional life of the bridge.

##### **401.11.5.2 Performance Measures**

##### **Condition**

There are no condition measures for this specification.

##### **Response**

**PO11.5.2a** Commence maintenance, repairs, or full or sectional replacement to bridge joints, bridge joint armour and joint anchor bolts that are potentially hazardous immediately.

**PO11.5.2b** Complete all maintenance, repairs, or full or sectional replacement to bridge joints, bridge joint armour and joint anchor bolts which have the potential to reduce the functional life of the structure and accelerate the deterioration of elements such as superstructure, substructure, bearings, bearing seats or ballast walls; from the time of defect identification within the following times shown in Table 401-26.

**Table 401-26: Bridge Joint Maintenance Timeframes**

Bridge Joints, Bridge Joint Armours and Joint Anchor Bolts		Mainline	Ramps	Paved Service Roads and Crossroads
a)	Repair damaged Bridge joint components	2 m	3 m	6 m
b)	Repair concrete and armour	4 m	6 m	6 m

*Legend: d – days, m – months*

**PO11.5.2c** Complete the replacement of damaged or leaking bridge joint seals within the maximum times shown in Table 401-27.

**Table 401- 27 Bridge Joint Seal Replacement Timeframe**

Mainline and Ramps	Paved Service Roads and Crossroads
4 m	6 m

*Legend: m – months*

**401.11.5.3 Specific Requirements**

- a) Bridge joints that are misaligned, cracked, worn, shrivelled, leaking, separated from joint walls or abraded are to be repaired or re-sealed or replaced. No bridge joint repairs shall be undertaken between December 1st and March 31st, unless they are a safety hazard.
- b) Joint anchor bolts that are damaged, rusted, loose or missing are to be tightened, repaired or replaced as appropriate.
- c) Armour that is bent, gouged, loose, separated or missing from the concrete deck is to be tightened, repaired or replaced as appropriate.
- d) Steel finger joints and sliding plate joints that are loose, cracked, have broken welds or have missing components are to be tightened, repaired or replaced as appropriate.

**401.11.5.4 Notes**

Project co shall refer to this Section, the manufacturer’s specifications, or the Design Team’s Design Data, as applicable.



## **401.11.6 Bridge Bearing Maintenance**

### **401.11.6.1 Objective**

To ensure that superstructure loads are properly transmitted and distributed to the substructure and that the superstructure is free to undergo necessary movement without developing damaging stresses that may limit the functional life of the Structure or affect safety.

### **401.11.6.2 Performance Measures**

#### **Condition**

**PO11.6.2a** There shall be no bearings and/or associated components that are potentially hazardous or have deteriorated to the condition where maintenance and repair will not restore the original design function of the particular bearing, as determined by the Structural Engineer.

#### **Response**

**PO11.6.2b** Immediately start repairs on bearings that are potentially hazardous, as determined by the Structural Engineer and complete within a time frame that is appropriate to the nature and urgency of the repair as determined by the Structural Engineer.

**PO11.6.2c** Complete realigning and repairing bearings, repairing or replacing anchor bolts and re-grouting concrete pads and bearing areas within 6 months.

**PO11.6.2d** Lubricate bearings once annually or in accordance with the manufacturer's recommendation.

### **401.11.6.3 Specific Requirements**

- a) Clean, lubricate, realign, regrout and repair bearings in accordance with the manufacturer's specifications or original design specifications.
- b) Maintain and clean all bearings and associated components that are rusty, misaligned, or are covered with winter abrasives, dirt or debris.
- c) Repair or replace all pads that are damaged, crushed, cracked, split, bulging or torn.
- d) Repair or replace anchor bolts and pins that are damaged or missing.
- e) Repair or replace concrete pads and bearing areas that are cracked or spalled.
- f) Replacement bearings and associated components shall be as originally designed or as designed by the Structural Engineer; and shall be installed using an installation and jacking procedure approved in writing by the Structural Engineer. The procedure is to be prepared by a Professional Engineer retained by Project Co.

## **401.11.7 Coating of Structures**

### **401.11.7.1 Objective**

To prevent corrosion in steel components of structures, and to present a neat and tidy appearance by maintaining previously coated surfaces or applying new coated surfaces to structures and associated components.

### **401.11.7.2 Performance Measures**

#### **Condition**

**PO11.7.2a** Prepare and coat all surfaces of structures and steel rail systems, where more than 10% of the coating system is deteriorated; and/or broken or damaged and the steel is corroding and rust is apparent.

#### **Response**

**PO11.7.2b** Within 6 months following inspection of the structure.

### **401.11.7.3 Specific Requirements**

Project Co shall use the same type and quality of material as on the existing structure or an alternate material as proposed by Project Co and acceptable to the Ministry.

## **401.11.8 Concrete Structure Maintenance**

### **401.11.8.1 Objective**

To restore and maintain the integrity and durability of concrete structures; to ensure the safety of users of the Bypass Infrastructure; and to maximize the functional life of the structures.

### **401.11.8.2 Performance Measures**

#### **Condition**

**PO11.8.2a** Tolerances or deviations of concrete are not to exceed the following limits:

- |      |                                    |               |
|------|------------------------------------|---------------|
| i)   | Deck surface                       | ±3 mm         |
| ii)  | Patches on other surfaces          | ± 5 mm        |
| iii) | Cross-Sectional dimensions         | ± 25 mm       |
| iv)  | Cover to reinforcing steel minimum | as per design |

## Response

**PO11.8.2b** Notify the Ministry immediately of any potentially hazardous deterioration or damage to the concrete structure.

**PO11.8.2c** If the Structural Engineer determines that there is a risk of structural failure under loading, immediately notify the Ministry and take the following actions:

- i) Restrict allowable loading on the structure;
- ii) Close the structure to all vehicular traffic; or
- iii) Close the structure to all use, and
- iv) Start repairs immediately as instructed by the Structural Engineer. Repairs are to be completed within 3 months, or within a time frame that is appropriate to the nature and urgency of the repair as determined by the Structural Engineer.

**PO11.8.2d** All other concrete repairs are to be completed within 6 months.

**PO11.8.2e** Structural cracks are to be repaired within 6 months.

### **401.11.8.3 Specific Requirements**

- a) All exposed concrete surfaces with possible exposure to salt or salt spray shall be treated with a silane sealer once every 5 years.
- b) Repairs are to be completed in a manner that ensures a sound, durable, and well-bonded patch to the prepared surface.
- c) Remove all deteriorated concrete at the repair site.
- d) Finish concrete surfaces to match the adjacent finished concrete surface profiles.
- e) Remove excess epoxy to match existing surface profile.
- f) Structural cracks are to be repaired by pressure injection of an epoxy material in accordance with the manufacturer's specifications.
- g) Seal non-structural cracks of concrete wearing surfaces in accordance with Section 401.11.2 Bridge Deck Maintenance] of this Section.
- h) The concrete mixes and patching material specifications in Table 401-28 are required.
- i) Patching material shall achieve minimum 28 day compressive strength of 35 MPa and shall be cementitious, non-shrink, non-metallic grout which may be polymer-modified

**Table 401-28: Concrete Mix and Patching Material Specifications**

Location	Minimum compressive strength at 28 days	Maximum nominal size aggregate mm	Maximum Water/Cement ratio by weight	Air content %	Slump maximum mm
Deck and Parapet	35 MPa	20	0.38	5-6.5	75
Abutments, Piers and Footings	30 MPa	28	0.40	5-6.5	75

**401.11.8.4 Notes**

- a) The above tolerances or deviations in PO11.9.2a are allowable only if they do not prevent the required fit of structural members.
- b) Materials of the same type and quality as the existing material shall be used.

**401.11.9 Steel and Aluminum Structure Maintenance**

**401.11.9.1 Objective**

To restore and maintain the integrity and durability of steel and aluminum structures; to ensure the safety of users of the Bypass Infrastructure; and to maximize the functional life of the structures.

**401.11.9.2 Performance Measures**

**Condition**

There are no condition measures for this specification.

**Response**

**PO11.9.2a** If the Structural Engineer determines that there is a risk of structural failure under loading, immediately notify the Ministry and take the following actions:

- i) Restrict allowable loading on the Structure;
- ii) Close the structure to all vehicular traffic; or
- iii) Close the structure to all use, and
- iv) Start repairs immediately as instructed by the Structural Engineer. Repairs are to be completed within 3 months or within a time frame that is appropriate to the nature and urgency of the repair as determined by the Structural Engineer.

**PO11.9.2b** Complete all other steel and aluminum structure maintenance within 4 months.

### **401.11.9.3 Notes**

- a) Steel and aluminum structure maintenance includes repair and/or replacement of lost, missing, deteriorated, or corroded pins/rivets, bolts and associated components, including but not limited to, catwalks, ladders, working platforms and fall arrest systems; and replacement of deteriorated steel or aluminum members.
- b) Materials of the same type and quality as the existing material shall be used.

### **401.11.10 Bridge Piling and Trash Rack Maintenance**

#### **401.11.10.1 Objective**

To ensure structural strength, to prevent scour and to maintain the impact resistance of bridge pilings.

#### **401.11.10.2 Performance Measures**

##### **Condition**

**PO11.10.2a** Deteriorated bridge pilings and associated components where maintenance and repair will not restore the original design function of the particular piling shall be replaced, as determined by the Structural Engineer; and,

**PO11.10.2b** Repair damaged trash racks and replace trash racks that cannot be repaired.

##### **Response**

**PO11.10.2c** Notify the Ministry immediately and the Structural Engineer shall assess the deficiency and risk of structural failure.

**PO11.10.2d** If the Structural Engineer determines that there is a risk of structural failure under loading, immediately notify the Ministry and take the following actions:

- i) Restrict allowable loading on the bridge;
- ii) Close the bridge to all vehicular traffic; or
- iii) Close the bridge to all use, and
- iv) Commence repairs of damaged bridge pilings and associated components as required within 2 days after receiving instructions from the Structural Engineer.

**PO11.10.2e** Complete maintenance and repairs to damaged bridge pilings and associated components as required within 6 months.

**PO11.10.2f** Complete repairs as soon as reasonably possible where structural damage requires complete re-construction of the pile bent or structure.

**PO11.10.2g** Complete non-emergency replacement of piles and associated components within 6 months.

**PO11.10.2h** Remove accumulated debris as soon as access permits.

### **401.11.10.3 Specific Requirements**

- a) Splice piles only if the base of the pile is sound.
- b) Tighten loose cables and fasteners.
- c) Replace broken or missing cables and fasteners.
- d) Repair or replace damaged or missing flashing and armour; and install flashing and armour where previously none was in place as directed by the Structural Engineer.
- e) Replacement pilings and associated components shall use pile types and installation procedures prepared by a Professional Engineer retained by Project Co, and acceptable to the Ministry.

### **401.11.11 Retaining Structure Maintenance**

#### **401.11.11.1 Objective**

To ensure the continued safe and stable condition of all retaining structures and associated components and maximize functional life.

#### **401.11.11.2 Performance Measures**

##### **Condition**

**PO11.11.2a** Retaining structures showing signs of continued movements are to be repaired, as recommended by a Geotechnical Engineer in consultation with a Structural Engineer and notify and copy the Ministry when a recommendation is received.

**PO11.11.2b** Any portion of a retaining structure showing signs of deterioration, deflection, deformation or settlement; is to be repaired or reinforced.

##### **Response**

**PO11.11.2c** Notify the Ministry immediately of hazardous or unstable retaining structures.

**PO11.11.2d** Commence maintenance repairs within 24 hours of becoming aware of deficiency or as directed by the Ministry, where the safety of the public or Bypass Infrastructure is at risk.

**PO11.11.2e** Maintain and repair retaining structure deficiencies within the following timeframes in Table 401-29.

**Table 401-29: Maximum Response Times for Retaining Structure Repair**

Mainline and Ramps	Paved Service Roads and Crossroads
6 m	12 m

*Legend m – months*

**PO11.11.2f** Accumulations of debris behind retaining structures are to be cleaned out annually, or as required to ensure the structure functions as designed.

**PO11.11.2g** Replace retaining structure components where maintenance and repair will not restore the original function of the structure and complete the replacement of retaining structure components within 6 months.

#### **401.11.11.3 Specific Requirements**

Replace concrete retaining structure components in accordance with Section 401.11.8 [Concrete Structure Maintenance] of this Section.

#### **401.11.11.4 Notes**

Ensure identified repairs are carried out in order of priority as determined by Project Co to ensure safety and to protect the Bypass Infrastructure.

#### **401.11.12 Multiplate Structure Maintenance**

##### **401.11.12.1 Objective**

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

##### **401.11.12.2 Performance Measures**

###### **Condition**

**PO11.12.2a** Multiplate structure components and bank and watercourse protection that are potentially hazardous for users of the Bypass Infrastructure or adversely affect the functional life of the structure are to be repaired and/or replaced.

**PO11.12.2b** The floor area of the structure shall be protected, as instructed by the Structural Engineer.

## Response

**PO11.12.2c** If the Structural Engineer determines that there is a risk of structural failure under loading, immediately notify the Ministry and take the following actions:

- 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, and
- iv) Initiate and make repairs immediately. Any loose, damaged or missing bolts shall be tightened or replaced within 10 days, or as soon as conditions allow.

**PO11.12.2d** Repair multiplate structures and protect the multiplate structure from scour and erosion to the inlet, outlet and foundation, within 6 months.

### **401.11.12.3 Specific Requirements**

- a) Scoured and/or eroded foundation material at the inlet, outlet, shore, bank and watercourse shall be replaced with concrete or angular rock in accordance with Section 401.7.3 [Watercourse Maintenance] of this Section.
- b) Concrete shall be maintained and repaired in accordance with Section 401.11.8 [Concrete Structure Maintenance] of this Section.
- c) Asphalt surfaces shall be maintained and repaired in accordance with Section 401.6.1 [Highway Pavement Maintenance] of this Section.

### **401.11.13 Bridge Barrier Maintenance**

#### **401.11.13.1 Objective**

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

#### **401.11.13.2 Performance Measures**

## Condition

**PO11.13.2a** Bridge barrier and rail systems and parapets or any deficiency of any bridge railings that are potentially hazardous for users of the Bypass Infrastructure are to be maintained, repaired or replaced as required.

## Response

**PO11.13.2b** Temporary railing is to be installed, as required, within 24 hours.

**PO11.13.2c** Complete maintenance, repairs and/or replacement within 2 months.



### **401.11.13.3 Specific Requirements**

- a) All concrete surfaces not covered with a pigmented concrete sealer and with possible exposure to salt or salt spray shall be treated with a silane sealer once every 3 years. All concrete surfaces with a pigmented concrete sealer coating shall have the pigmented sealer reapplied once every 7 years.
- b) Perform concrete repairs in accordance with Section 401.11.8 [Concrete Structure Maintenance] of this Section.
- c) Maintain bridge rail systems and parapets to original design.
- d) Perform minor painting of bridge rail systems in accordance with Section 401.11.7 [Coating of Bridge Structures] of this Section.

### **401.11.13.4 Notes**

All fasteners shall be hot-dip galvanized or stainless steel.

### **401.11.14 Differential Settlement**

#### **401.11.14.1 Objective**

To monitor and respond to settlement for structures, embankments and roadways

#### **401.11.14.2 Performance Measures**

**PO11.14.2a** Actual foundation, embankment and roadway deformations shall be measured for the Bypass Infrastructure at 2 years, 5 years, 10 years and 20 years after the Substantial Completion Date. Project Co shall confirm that the required service and ultimate limit states performance of Structures will not be adversely affected by the actual foundation deformations.

**PO11.14.2b** Where deformations are found to adversely affect the required performance, Project Co shall design and implement measures to ensure that the required performance and Design Life and Remaining Service Life are achieved.

### **401.11.15 Scour Damage**

#### **401.11.15.1 Objective**

To monitor and remediate any scour damage, erosion and channel instability around structures.

#### **401.11.15.2 Performance Measures**

### **Condition**

**PO11.15.2a** Scour protection, erosion control, and waterway stabilization measures to be maintained, repaired or replaced.

## Response

**PO11.15.2b** Project Co shall undertake detailed hydro technical inspections every 5 years to ensure the original hydrology/hydraulic analyses and design for structures is not compromised during the Operational Term. This shall include ensuring that all foundations are protected from scour and adjacent facilities and river banks are properly protected from scour.

**PO11.15.2c** Project Co shall identify, design and construct all scour protection, erosion control, and waterway stabilization necessary to prevent damage to structures, roadways or property affected.

## 401.12 EMERGENCY OPERATION AND MAINTENANCE

### 401.12.1 Emergency Response Planning

#### 401.12.1.1 Objective

To provide emergency response.

#### 401.12.1.2 Performance Measures

## Condition

There are no condition measures in this specification.

## Response

**PO12.1.2a** Develop and implement an emergency response plan (the “**Emergency Response Plan**”) as required by Table 401.-2 [Schedule of Deliverable Reports and Records – Response Time Measures] of this Section that provides the basis for how Project Co responds to any and all emergencies, such as but not limited to the following:

- i. Floods;
- ii. Mud and earth slides
- iii. Extended winter storms;
- iv. Toxic spills;
- v. Structural damage; and
- vi. Traffic crashes, when requested by emergency personnel and/or where Project Co personnel are first to the emergency location.

**PO12.1.2b** Ensure that staff contact information is available to the Ministry, local governments and emergency service providers by March 31 annually and that notification will take place that may be required to respond to any and all emergencies.

**PO12.1.2c** Complete all necessary paperwork and provide all necessary documentation and records (inclusive of taking photographs at Emergency Sites), as may be required by the Ministry or other Local Authorities.

### **401.12.1.3 Specific Requirements**

- a) As a minimum, the Emergency Response Plan shall address the following:
- Project Co's response role and responsibilities;
  - Emergency maintenance in accordance with Section 400 [Operations Infrastructure] to this Schedule;
  - Responding to other provincial emergencies;
  - Integration with the Ministry protocols;
  - Process for ensuring that current and accurate staff contact information is available;
  - Response and recovery training program for staff; and
  - Documentation.
- b) Train employees in procedures related to response/recovery and other types of emergency training as required by the Ministry.
- c) Cooperate with the Ministry and other Local Authorities when responding to emergencies.

### **401.12.1.4 Notes**

- a) The Emergency Response Plan can be prepared as a stand-alone document or incorporated as part of the Operation and Maintenance Plan.
- b) Recommended references include:
- Bridge Standards and Procedures Manual; and
  - *Saskatchewan Traffic Control Devices Manual for Work Zones*.
- c) Safety of users of the Bypass Infrastructure is paramount and emergency response shall comply with this Schedule. Emergency response will receive close public attention and scrutiny and is another critical aspect of management of this Agreement.

## **401.12.2 Highway Incident and Vandalism Response**

### **401.12.2.1 Objective**

To protect users of the Bypass Infrastructure from conditions that are potentially hazardous; and to restore the movement of traffic.

Bypass Infrastructure incident and vandalism response includes traffic control and site management for Bypass Infrastructure incidents, communicating and reporting to all necessary parties, and re-establishment of normal travel conditions as soon as practicable.

#### **401.12.2.2 Performance Measures**

##### **Condition**

**PO12.2.2a** Prepare for and respond to Incidents and vandalism on the Bypass Infrastructure in accordance with the specific requirements below.

**PO12.2.2b** Evacuate the area if an explosion is possible.

**PO12.2.2c** Ensure the safety of users of the Bypass Infrastructure in the event of a spill within rights-of-way involving hazardous substances in accordance with the requirements given in the specific requirements below.

##### **Response**

**PO12.2.2d** Document traffic Incidents attended by Project Co, i.e. take photographs, diary notes, record Bypass Infrastructure conditions and locations relating to; and deliver such documents to the Ministry when requested, within 3 days of the date of request.

**PO12.2.2e** Immediately implement traffic control in accordance with Section 401.10.10 [Highway Traffic Control] of this Section, in response to Incidents on the Bypass Infrastructure (e.g., motor vehicle crashes, spills) and remain at the scene until normal traffic flow is restored.

#### **401.12.3 Specific Requirements**

- a) Prepare for and respond to Incidents and vandalism on the Bypass Infrastructure by:
- Securing the area as required to ensure the safety of users of the Bypass Infrastructure;
  - Communicating Incidents involving Bypass Infrastructure Closures to the Ministry in accordance with Section 401.5.1 [Highway Condition Reporting] of this Section;
  - Ensure the safety of employees and the travelling public when there are spills on the Bypass Infrastructure in conjunction with and cooperation with Local Authorities, Police and the Ministry;
  - Call the Spill Control Center; take suitable action to contain the spill and make arrangements to have the spill cleaned up, unless the owner of the spill is a third party who is, in such cases, responsible for the spill.
  - Removing vehicles from the travel lanes and shoulders, as necessary (where this service is not provided by others); and

- Removing and disposing of cargo and debris from the travel lanes and shoulders, to restore traffic flow (where this service is not provided by others).
- b) Ensure the safety of users of the Bypass Infrastructure in the event of a spill within rights-of-way involving hazardous substances in accordance with all Environmental Laws by:
  - Alerting the Ministry, Police 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;
  - Training field personnel and field supervisors in accordance with all applicable laws and regulations for hazardous substance material identification and risk assessment; and
  - Closing and keeping the Bypass Infrastructure closed 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.
- c) Repair damage to the Bypass Infrastructure caused by Incidents or vandalism in accordance with the appropriate specification set out in this Section and its Performance Measures.
- d) Prepare a claim for SGI for traffic incidents resulting in damages to the Bypass Infrastructure.

#### **401.12.3.1 Notes**

- a) Transport Canada's Response and Operations Division operates CANUTEC to provide a 24 hour hazardous substances reference, data bank and expert assistance service.
- b) Establish and record information in accordance with the *Transportation of Dangerous Goods Regulation (Canada), Part 8; 8.1- 8.3* and the *Workers Compensation Act (Saskatchewan)*.

#### **401.12.4 Incident Response**

##### **401.12.4.1 Objective**

To ensure the safe and efficient movement of traffic by the timely detection and removal of Incidents and other restrictions affecting traffic on the Bypass Infrastructure.

##### **401.12.4.2 Performance Measures**

#### **Condition**

##### **PO12.4.2a**

Monitor the Bypass Infrastructure 24 hours a day, 7 days a week to:

- i. Detect and verify Incidents in accordance with the requirements of this Schedule, including Sections 401.13.1 [Highway Inspection] and 401.13.2 [Highway Patrol] of this Section;
- ii. Dispatch and communicate with Project Co's vehicles attending the Incident site;

- iii. Coordinate Incident response with emergency response agencies, as required;
- iv. Monitor response;
- v. Record and log Incident details in the Incident management system; and
- vi. Enter Incident-related information into the Incident management system.

- PO12.4.2b** Provide response and clearance of obstructions from the Bypass Infrastructure by:
- i. Removing all debris;
  - ii. Cleaning up and eliminating any hazards caused by spilled fluids from damaged or disabled vehicles;
  - iii. Assisting the police and/or other emergency response agencies in traffic control or other requested assistance; and
  - iv. Provide assistance to users of the Bypass Infrastructure to address non-recurring or Incident-related congestion, including but not limited to:
    - Removing vehicles stopped on the shoulder or roadway;
    - Arranging transportation for stranded motorists or other users of the Bypass Infrastructure to the first available location in order to make their own arrangements for assistance when initial efforts by the responding vehicle operator to fix the problem or attempts to make cellular calls for assistance are unsuccessful.

- PO12.4.2c** Perform all services in accordance with the *Saskatchewan Traffic Control Devices Manual for Work Zones*, the *Highway Traffic Act* (Saskatchewan) and the *Motor Vehicle Transport Act* (Saskatchewan).

- PO12.4.2d** Maintain the security of the structures and prevent users of the Bypass Infrastructure from gaining access to areas other than the travel lanes or sidewalks, make note of obviously distraught people and report the location of potential suicide Incidents to the police.

## Response

- PO12.4.2e** Provide reports on Incidents to the Ministry upon request within 48 hours.

- PO12.4.2f** Detect Incidents as quickly as possible. This response time is to be established during term and agreed with the Ministry.

- PO12.4.2g** Report all Incidents to the Ministry within 5 minutes of detection.

- PO12.4.2h** Have an Incident response vehicle, which has the capability to effectively and efficiently manage the Incident, at the scene of an Incident within 30 minutes of detection for all Incidents within the Bypass Infrastructure

- PO12.4.2i** Remove vehicles or other obstructions from the travel lanes of the Bypass Infrastructure within 10 minutes of the patrol vehicle arrival on scene, except

where a motor vehicle crash requiring the presence of the police authorities or where the nature of the obstruction is such that it is unreasonable or impractical to remove it, and/or where traffic conditions make it physically impossible to clear it. Follow the Ministry's protocol in regards to abandoned vehicles.

**PO12.4.2j** Report any damage to the Bypass Infrastructure to the Ministry within 30 minutes of detection or notification to Project Co.

#### **401.12.4.3 Specific Requirements**

- a) Complete a daily log book for noting all traffic disruption Incidents and their circumstances, and make that log book available to the Ministry upon request.
- b) Project Co shall ensure that all vehicles used to attend an Incident scene are:
  - In compliance with the Motor Vehicle Transport Act (Saskatchewan) and Regulations there under regarding towing vehicles;
  - Capable of direct communication with the Provincial Highways Condition Centre and other patrol vehicles at all times; and
  - Equipped with:
    - firefighting equipment;
    - basic first aid equipment;
    - safety flares;
    - brooms, shovels, jumper cables, floor jack, tire wrench, basic toolkit, and other equipment as directed by the Ministry;
    - flashing arrow board;
    - Stop/Slow paddle;
    - Portable rollup type signs (CRASH AHEAD, RIGHT LANE CLOSED, LEFT LANE CLOSED);
    - 20 liters of liquid absorbing compound; and
    - Maintained in a clean and tidy condition at all times and the passenger area is clean and available for transport of one passenger.
- c) Project Co shall ensure that all drivers/operators conduct themselves in a polite and courteous manner and are equipped with appropriate personal protective equipment including without limitation:
  - Reflectorized rain gear;
  - Rubber and leather gloves;
  - Eye protection (safety glasses);
  - Regulation safety toed boots;
  - Regulation hard hats;
  - Clean, reflectorized Type 2 orange coveralls; and
  - Name tags and logos on all apparel.
- d) Maintain the security of the structures and prevent users of the Bypass Infrastructure from gaining access to areas other than the travel lanes or sidewalks, make note of obviously distraught people and report the location of potential suicide Incidents to the Provincial Highways Condition Centre.

**401.12.5 Flood Control and Washout Response**

**401.12.5.1 Objective**

To safeguard users of the Bypass Infrastructure and adjacent properties; to be proactively prepared for floods and washouts; to prevent damage to the Bypass Infrastructure; to restore traffic movement and to repair damage caused by flood and washout events.

**401.12.5.2 Performance Measures**

**Condition**

**PO12.5.2a** Take all actions required to control the flow of water on or adjacent to the Bypass Infrastructure and protect and repair the Bypass Infrastructure, including placement of riprap in accordance with Section 401.7.3 [Watercourse Maintenance] of this Section if required.

**Response**

**PO12.5.2b** Inspect immediately, any potential for damage caused by flooding or washout conditions, and implement traffic control as necessary. Inspection shall include recording high water levels when water elevations exceed the crown of culverts and provide the water elevation data to the Ministry.

**PO12.5.2c** When a flood or washout affects the travel lanes, immediately establish at least one through lane for traffic, and commence work to restore the Bypass Infrastructure.

**PO12.5.2d** Immediately inform the Ministry where floods or washouts result in or necessitate Bypass Infrastructure closures and provide detours where necessary.

**PO12.5.2e** Within 2 days of the end of a storm or other event, identify any potential for further flooding and/or washout.

**PO12.5.2f** Perform flood control and commence washout response as detailed above in accordance with the times indicated in Table 401-30 below.

**Table 401-30: Washout Response Times**

Washout Category	Mainline and Ramps	Paved Access Roads
Washouts cutting one or more lanes of a highway	4 h	12 h

*Legend: h – hours*



## 401.12.6 Mud and Earth Slide Response

### 401.12.6.1 Objective

To safeguard users of the Bypass Infrastructure and adjacent properties; to restore traffic movement and to repair damage to the Bypass Infrastructure caused by mud and earth slides.

### 401.12.6.2 Performance Measures

#### Condition

**PO12.6.2a** At locations that are subject to slides exceeding 50 m<sup>3</sup>, Project Co shall engage a Geotechnical Engineer to investigate the sites and Project Co shall perform work in accordance with the recommendations of such Geotechnical Engineer slide escarpments from reaching the shoulder top and travel lanes.

#### Response

**PO12.6.2b** Immediately inspect any potential for damage caused by mud, earth slides, and implement traffic control as necessary.

**PO12.6.2c** When a mud and earth slide affects the travel lanes, immediately establish at least one through lane for traffic, and commence work to remove mud, earth deposits and restore the Bypass Infrastructure after being determined safe to do so.

**PO12.6.2d** Immediately inform the Ministry where slides result in Bypass Infrastructure closures and provide detours around the affected sections where necessary.

**PO12.6.2e** Within 2 days of the end of a storm or other event, identify any potential for further mud, earth or rockslides and notify the Ministry.

**PO12.6.2f** Commence the repair of any damage to Bypass Infrastructure resulting from mud, and earth slide events in accordance with the appropriate specification set out in this Section within the response times shown in Table 401-31, and complete the work as soon as reasonably possible.

**Table 401- 31: Slide Response Times**

Event	Mainline and Ramps	Paved Service Roads and Crossroads
Slides restricting traffic	4 h	6 h

*Legend: h – hours, min - minutes*

### **401.12.6.3 Specific Requirements**

Areas suspected of being unstable and locations subject to slides shall be monitored and patrolled in accordance with Section 401.13.2 [Highway Patrol] of this Section until permanent repairs are affected.

### **401.12.7 Structure Damage Response**

#### **401.12.7.1 Objective**

To ensure the safety of users of the Bypass Infrastructure, to restore all affected structures to their original condition, and to maximize their functional life.

#### **401.12.7.2 Performance Measures**

##### **Condition**

**PO12.7.2a** Notify the Ministry where the safety of users of the Bypass Infrastructure is potentially compromised and ensure that the Structural Engineer completes an inspection.

**PO12.7.2b** Mobilize to reinforce all critical members with temporary bracing or cables if the Structural Engineer determines that the structure is sufficiently safe to work on.

##### **Response**

**PO12.7.2c** If the Structural Engineer determines that there is a risk of structural failure under loading, immediately notify the Ministry and take the following actions until repairs have been completed in accordance with the recommendations of the Structural Engineer:

- i. Restrict allowable loading on the bridge;
- ii. Close the bridge to all vehicular traffic; or
- iii. Close the bridge to all use, and
- iv. Construct a detour route.

**PO12.7.2d** Start installation of temporary barriers or rail placements within 24 hours

#### **401.12.7.3 Specific Requirements**

Installation of temporary barriers or railing placements in accordance with Section 401.11.13 [Bridge Barrier Maintenance].

**401.12.8 Natural Event Response**

**401.12.8.1 Objective**

To respond, provide traffic control, clean-up, and repair all damage resulting from natural events.

**401.12.8.2 Specific Requirements**

The following responsibility matrix in Table 401-32 provides a summary of Project Co’s responsibilities:

**Table 401-32: Summary of Responsibility**

Activity	Scope of Responsibility	Description of Responsibility
Incident Response – Cleanup and Repair of Asset Damage	All Lanes	Project Co shall be responsible for removing debris off the road (including shoulders and roadside benches) in accordance with Section 401.12.5[Mud and Earth Slide Response] of this Schedule.  Project Co shall be responsible for repairing damage caused by natural events as required in accordance with, and subject to, the terms of this Agreement.
Incident Response – Protection	All Lanes	Project Co shall engage a Geotechnical Engineer where either: a) Mud/ earth fall/ or debris slide volumes exceed 1 m3, on the travelled Bypass Infrastructure lanes, at any site; b) Significant asset damage; c) Injury occurs; d) One or more lanes are closed by debris; e) Settlement or other deformation in roadway or Structures; or f) Further instability is likely or there is a perception of further hazard. Project Co shall be responsible for undertaking critical slope mitigation works, to protect the road from further impact, as recommended by a Geotechnical Engineer, immediately following the event.

**401.12.8.3 Debris Removal Record**

All instances where debris is removed off the road, an activity record is required for the purpose of identifying areas of risk. This includes reoccurring localized slides and debris caused by drainages issues.

Project Co shall record and file all incidents of road debris removal resulting from natural events, and include these in the OM&R Monthly Report. Details include:

- Date and time;
- Author of Report;
- Highway;
- Location of the event in terms of a route position (Ministry linear referencing methods RFI & LKI) and UTM coordinates;
- Side of the road;
- Weather conditions over preceding 24 hours (rainfall and temperature); and
- Impact on road availability including the time period where the road was affected.

### **401.13 INSPECTION**

#### **401.13.1 Highway Inspection**

##### **401.13.1.1 Objective**

To develop a comprehensive knowledge of the Bypass Infrastructure; to identify deficiencies that require maintenance; and to identify conditions, not covered by the specifications set out in this Section, which could affect the Bypass Infrastructure.

##### **401.13.1.2 Performance Measures**

#### **Condition**

There are no condition measures for this specification.

#### **Response**

**PO13.1.2a** A full and comprehensive inspection of the Bypass Infrastructure and components of the Bypass Infrastructure is to be conducted annually and the results documented.

**PO13.1.2b** Additional inspections are to be conducted immediately in response to reports by the public, Local Authorities, the Police and the Ministry of any condition that is potentially hazardous.

**PO13.1.2c** Immediately report to the Ministry any hazardous or deficient condition that is not covered by this Project Agreement or this Section.

**401.13.2 Highway Patrol**

**401.13.2.1 Objective**

To identify conditions that are potentially hazardous; to identify conditions that could threaten the Bypass Infrastructure; and attend to existing or changing conditions.

**401.13.2.2 Performance Measures**

**Condition**

There are no condition measures for this specification.

**Response**

**PO13.2.2a** Patrols of the Bypass Infrastructure are to be completed in accordance with the frequencies established in the tables below in Table 401-33 and Table 401-34.

**Table 401- 33: Highway Patrol – Summer (April 16 to October 31)**

<b>Timing</b>	<b>Mainline and Ramps</b>	<b>Paved Service Roads and Crossroads</b>
i) At all times	24 h	2 d
ii) During periods of high water flow	2 h	4 h

*Legend: h – hours, d – days*

**Table 401- 34: Highway Patrol – Winter (November 1 to April 15)**

<b>Timing</b>	<b>Mainline and Ramps</b>	<b>Paved Service Roads and Crossroads</b>
i) At all times	24 h	2 d
ii) Winter patrols (during freezing temperatures and snowfall)	4 h	8 h

*Legend: h – hours, d – days*

**PO13.2.2b** Take immediate and appropriate action during patrols to protect users of the Bypass Infrastructure from hazardous situations.

**PO13.2.2c** Report to the Ministry immediately, upon detection or notification, any conditions which affect the Bypass Infrastructure in performing its designed function.

### **401.13.2.3 Specific Requirements**

- a) During periods of high water flow, give appropriate attention to areas known to be impacted first by high water flow.
- b) When temperatures are fluctuating between freezing and thawing, increase patrols to a frequency that will allow Project Co to respond to changing conditions; and, give appropriate attention to areas known to be impacted first by weather events.
- c) Ensure patrol vehicles are prepared to deal with conditions, by carrying winter abrasive or de-icing chemical.
- d) Project Co may patrol using vehicles not equipped to apply chemical or abrasive if highway surface conditions on the Bypass Infrastructure are bare and dry and if they can reasonably be expected to remain so. Under no circumstances shall Project Co 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.

### **401.13.3 Bridge and Structure Maintenance Inspection**

#### **401.13.3.1 Objective**

To develop a comprehensive knowledge of the condition of all bridges, other structures and associated components; to identify deficiencies that require maintenance; and to identify conditions, not covered by the specifications set out in this Section that could affect the safety or functionality of bridges, other structures and associated components. To develop an inspection program including required documentation and procedures, including inspector training and qualifications.

#### **401.13.3.2 Performance Measures**

##### **Condition**

**PO13.3.2a** Deficiencies and movement of structures and their components shall be monitored and the Ministry notified of any hazardous or deficient conditions or potentially hazardous conditions that are not covered by this Agreement or this Section.

**PO13.3.2b** Ensure that load restriction signage is in place on all bridges with load restrictions.

**Response**

**PO13.3.2c** Inspect bridges, other structures and associated components within the minimum frequencies shown in Table 401-35.

**Table 401- 35: Bridge Inspection Frequency**

Structure Type	Mainline and Ramps	Paved Service Roads and Crossroads
(i) Concrete and steel bridges and other structures	4 m	6 m
(ii) Multiplate structures	6 m	1 y
(iii) Sign structures	1 y	1 y

*Legend: m = months, y = year*

**PO13.3.2d** Notwithstanding the above table, immediately inspect a bridge or structure with a safety or structural deficiency, and continue inspections at a frequency determined by the Structural Engineer.

**PO13.3.2e** Operate backup power units, compressors, and other related equipment for a minimum of 1 hour each month.

**401.13.3.3 Specific Requirements**

Give special attention during inspections to bridges with sub-standard load carrying capacity to ensure that existing capacities are maintained or improved.

**401.14 OPERATIONAL VEHICLES STANDARDS**

**401.14.1 Vehicle and Equipment Requirements**

**401.14.1.1 Objective**

To ensure visual consistency for all Bypass Infrastructure operational vehicles and equipment throughout to allow users of the Bypass Infrastructure to easily recognize the presence of Bypass Infrastructure Operations and OM&R Work.

**401.14.1.2 Performance Measures**

**Condition**

**PO14.1.2a** Ensure all operational vehicles and equipment is:  
 i.) Are all the same colour scheme (colour to be agreed with the Ministry).

ii.) Clearly identified as a Project Co maintenance vehicle.

**PO14.1.2b** Ensure that all operational vehicles have flashing beacons the same colour as the Ministry currently uses. All markings to meet or exceed current MHI standards.

**PO14.1.2c** Ensure that all future operational vehicles have flashing beacons the same colour as the Ministry currently uses. All markings to meet or exceeds MHI standards, at the time.

**PO14.1.2d** Ensure that operational vehicles are licenced in the Province of Saskatchewan.

### Response

There are no response measures for this specification.

#### **401.14.1.3 Specific Requirements**

All lamps shall be dimmable for night work.

### **401.15 SAFETY MANAGEMENT**

#### **401.15.1 Safety Management Requirements**

##### **401.15.1.1 Objective**

To implement a strong road safety culture based on being both proactive in ensuring construction complies with current safe design standards, guidelines and policies and being reactive to existing known hazards by ensuring that higher risk sites are progressively treated.

##### **401.15.1.2 Performance Measures**

### Condition

**PO15.1.2a** Reduce the number and severity of crashes (by applying proactive, best practice road safety engineering techniques).

**PO15.1.2b** Reduce the number of known road safety hazards on the Bypass Infrastructure route.  
Review all fatality crash reports where road conditions are deemed to be a contributing factor and mitigate such circumstances, if feasible.

**PO15.1.2c** Reduce all serious and fatal crashes where road conditions are deemed to be a contributing factor (mitigate all significant safety hazards along road sections that are reconstructed under this Project Agreement).



**PO15.1.2d** Provide appropriate traffic control at all maintenance sites, construction sites, planned events, and planned closures.

**Response**

**PO15.1.2e** Develop and implement a Safety Management and Intervention Plan (the “**Safety Management and Implementation Plan**”) as required in Table 401-2 of this Section.

**PO15.1.2f** Remedy any hazard within 24 hours of becoming aware of the deficiency and complete permanent repair within 30 days.

**401.15.1.3 Specific Requirements**

- a) Stay abreast of and apply technology changes and revisions to safety standards.
- b) Provide proactive Traffic Management at all work sites and Incidents in accordance with Sections 401.12.2 [Highway Incident and Vandalism Response] and 401.10.10 [Highway Traffic Control] of this Section.
- c) The Safety Management and Intervention Plan will, as a minimum, address the following issues:
  - Understanding of compliance with respective laws, regulations and the Workers’ Compensation Board requirements;
  - Applying crash data in association with inspections, to identify safety hazards, determine trends and identify improvements to reduce safety risks;
  - A register of identified hazards; and
  - Working with other stakeholders.
- d) Respective laws, regulations and the Workers Compensations Board (WCB) requirements shall be respected at all times.

**401.15.1.4 Notes**

The Safety Management and Intervention Plan provides the framework to improve the safety of the Bypass Infrastructure corridor and to ensure health and safety systems are established and implemented. It can be prepared as a stand-alone document or incorporated as part of the Operation and Maintenance Plan.

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