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500.0 HANDBACK

500.1 INTRODUCTION

500.1.1 General

This section defines the scope and level of service requirements for the Bypass Infrastructure assets to be returned to the Ministry at the Expiry Date. The objectives of these requirements are to:

- a) Define minimum required condition levels at the Expiry Date;
- b) Ensure a suitable remaining life expectancy;
- c) Achieve remaining Design Life expectations;
- d) Ensure all Bypass Infrastructure is fully operational;
- e) Ensure all documentation for the Bypass Infrastructure is up-to-date and submitted to the Ministry; and
- f) No outstanding safety issues.

Notwithstanding the requirements set out in this section, Project Co shall comply with the requirements of the Key Performance Measures (KPMs), Asset Preservation Performance Measures (APPMs) and the Operational Performance Measures (OPMs) as set out in Section 401 (Operations and Maintenance) and Section 402 (Asset Preservation) to this Schedule 15.

The requirement set out in this Schedule shall apply at the Expiry Date, in addition to all other requirements of this Project Agreement, including the Asset Preservation Performance Measures and Operational Performance Measures.

500.1.2 Remaining Service Life

The Remaining Service Life (“RSL”) for the purposes of this Schedule 15-3 – OM&R and Handback shall be the service life that is projected to remain for each component of the Bypass Infrastructure measured in years taking into account the historic performance of Bypass Infrastructure of similar construction used under similar conditions (the **“Remaining Service Life” or “RSL”**). At the Expiry Date, the Bypass Infrastructure shall meet the performance levels noted in this Project Agreement. The RSL will be determined to have been achieved only if there is no projected need for rehabilitation in respect of the Bypass Infrastructure during the specified RSL period (for clarity, such rehabilitation excludes basic routine maintenance of any component of the Bypass Infrastructure which will be required during the anticipated RSL period.)

500.2 HIGHWAY RUNNING SURFACE

The RSL requirements for Highway Running Surfaces refer specifically to the future projected structural capacity of the pavements. At the Expiry Date, the RSL of each and every lane of the Highway Running Surfaces shall be such that it requires no more than a 50 mm asphalt concrete overlay or equivalent treatment at the end of the specified RSL period. The rehabilitation design

shall be based on 15 years of traffic loading, starting as of the date the Ministry assumes responsibility for the paved travel lanes and the analysis conducted according to the Ministry’s current pavement design methodology using primary weight standards.

At the Expiry Date, when the Ministry assumes responsibility for the Highway Running Surfaces, Project Co shall ensure that the Highway Running Surface meets or exceeds the requirements defined in Table 500-1. (For clarity, the stated performance measure requirements must be met at the commencement of the RSL period and not throughout.)

Table 500-1: Handback Requirements – Highway Running Surfaces

Asset Category	Required Condition
All Highway Running Surfaces	<ul style="list-style-type: none"> • Conformance with the condition requirements as set out in Asset Preservation Section 402. • Conformance with the performance measures as set out in Operations and Maintenance Section 401. • The pavement surface shall be free of any evidence of structural weakness, pitting, potholes, ravelling, segregation, scaling, delamination, localized roughness and all other deficiencies. • All cracks and joints shall be sealed with a sealant acceptable to the Ministry. • The pavement surface shall be free and clear of dirt, sand and other debris.
Asphalt Paved Travel Lanes and Paved Entrance / Exit Ramps	<ul style="list-style-type: none"> • Minimum required RSL of 10 years. • Cross-slope and super elevation <0.5% deviation from design rate.
Asphalt Paved Shoulders	<ul style="list-style-type: none"> • Minimum required RSL of 10 years.
Asphalt Paved Medians	<ul style="list-style-type: none"> • Minimum required RSL of 10 years.
Asphalt Paved Access Roads	<ul style="list-style-type: none"> • Minimum required RSL of 5 years.
Portland Cement Concrete Paved Travel Lanes, Entrance / Exit Ramps, Shoulders and Medians	<ul style="list-style-type: none"> • Minimum required RSL of 10 years.
<p>Notes:</p> <ul style="list-style-type: none"> • Calculated on a lane-km basis, the RSL of the Highway Running Surfaces at the Expiry Date must exist at or above the limits defined. Where pavement patches (areas less than 400 m²) exist within traffic lanes and the pavement life is not clearly discernable, and then the oldest surface age at the location shall be used in the calculations. • All testing and measuring for compliance shall be completed by Project Co according to the requirements outlined in Asset Preservation Section 402.3.1 within the same calendar 	

Asset Category	Required Condition
	<p>year as when the Expiry Date occurs. All compliance testing and monitoring results shall be supplied to the Ministry by September 1 of the year in which the Expiry Date falls or two months prior to the Expiry Date, whichever occurs first. Notwithstanding the foregoing, the Ministry may elect to test or measure the Roadway independently if there are concerns regarding the serviceability of the Roadway.</p> <ul style="list-style-type: none"> • Pavement strength testing to determine the structural capacity and the rehabilitation needed for the RSL requirement above will be completed by an independent consultant retained and paid for by the Ministry and acceptable to both the Ministry and Project Co. Project Co shall be responsible for providing all traffic accommodation to allow pavement strength testing or other testing (either destructive or non-destructive), as required. • Cross-slope percentages refer to a numeric deviation from the designed percentage and not to a percentage deviation. This means that if the designed percentage is 2% the deviation referred to is >1.5% and <2.5%

500.3 STRUCTURES

At the Expiry Date, the structures shall be in adequate condition and function as designed with no loss of structural strength and shall meet the Performance Measures. Project Co shall complete any required maintenance or rehabilitation prior to the Expiry Date to meet the required functionality state and condition prior to returning the Structures to the Ministry’s control and management.

Project Co shall perform annual condition inspection of all Structures in accordance with Section 402 (Asset Preservation) and report the findings within the most current Annual APPM Achievement Report as outlined in Asset Preservation Section 402.2.5. Project Co shall also issue a structure inspection report for each Structure, signed and sealed by the Bridge Structural Engineer in accordance with the procedures shown in the Ontario Structure Inspection Manual (OSIM), Saskatchewan OSIM Supplement Structures Inspection Guide Policy and Section 401 to this Schedule 15-3 – OM&R and Handback. Any required outstanding work or safety issues identified by such inspections shall be completed or rectified, as the case may be, by Project Co prior to the Expiry Date.

At the Expiry Date, when the Ministry assumes responsibility for the Structures, it shall meet or exceed the requirements defined in Table 500-2.

Table 500-2: Handback Requirements – Structures

Asset Category	Required Condition
All Structures and Elements	<ul style="list-style-type: none"> • Conformance with the condition requirements as set out in Section 402. • Conformance with Operations and Maintenance Section 401 and OPM’s met.
Bridge Elements - Girders, Piers, Foundations, and Abutments	<ul style="list-style-type: none"> • New - RSL shall be the Minimum Required Design Life of the element less the age of the element at the Expiry Date. • Existing - Minimum required RSL of 40 years.
Bridge Deck - Asphalt	<ul style="list-style-type: none"> • Minimum required RSL of 10 years.
Bridge Deck - Water Proofing Membrane	<ul style="list-style-type: none"> • Minimum required RSL of 10 years.
Bridge Deck - Concrete	<ul style="list-style-type: none"> • New - RSL shall be the Minimum Required Design Life of the bridge deck less the age of the bridge deck at the Expiry Date. • Existing - Minimum required RSL of 40 years. • No areas with a material defect severity of medium, severe or very severe for scaling, spalling and unfilled cracks. • No areas of alkali aggregate reactivity. • Copper Sulfate Electrode (CSE) test results showing a minimum of 90% with readings less negative than -0.300 V. • Maximum total average chloride content of 0.020, by percent weight, at the top mat of reinforcing or 100 mm depth, whichever is less. • No areas that are delaminated or debonded as determined by chain drag testing or hammer sounding in accordance with ASTM D4580
Bridge Elements – Curbs, Barriers and Medians	<ul style="list-style-type: none"> • New - RSL shall be the Minimum Required Design Life of the element less the age of the element at the Expiry Date. • Existing - Minimum required RSL of 40 years. • CSE test results showing a minimum of 90% of readings less negative than -0.300 V. • No areas that are delaminated as determined by chain drag testing or hammer sounding in accordance with ASTM D4580.

Asset Category	Required Condition
Bridge Joints	<ul style="list-style-type: none"> • Minimum required RSL of seals at the Expiry Date shall be 10 years. • Minimum required RSL of steel components of the joint at the Expiry Date shall be 25 years.
Bridge Bearings	<ul style="list-style-type: none"> • New - RSL shall be the Minimum Required Design Life of the bridge bearings less the age of the bridge bearings at the Expiry Date. • Existing - Minimum required RSL of 10 years. • Minimum 50 µm galvanized or 70 µm metallized coating thickness.
Bridge Railings and Piles	<ul style="list-style-type: none"> • Minimum 50 µm galvanized coating thickness or 70 µm metallized thickness.
Major Retaining Walls	<ul style="list-style-type: none"> • New - RSL shall be the Minimum Required Design Life of the Major Retaining Wall less the age of the Major Retaining Wall at the Expiry Date.
Major Culverts	<ul style="list-style-type: none"> • New - RSL shall be the Minimum Required Design Life of the Major Culvert less the age of the Major Culvert at the Expiry Date. • Existing – Minimum required RSL of 10 years.
Major Sign Structures	<ul style="list-style-type: none"> • New - RSL shall be the Minimum Required Design Life of the Major Sign Structure less the age of the Major Sign Structure at the Expiry Date. • Minimum 50 µm galvanized coating thickness or 70 µm metallized thickness.
<p>Notes:</p> <ul style="list-style-type: none"> • CSE and chloride testing and chain drag testing shall be carried out at 12 months prior to the Expiry Date. • CSE and chloride testing and chain drag testing shall be carried out in accordance with the requirements of ASTM C876, ASTM D4580, and the Ministry’s bridge inspection procedures. • Chloride content testing is performed in accordance with the “Standard Test Method for Chloride Content in Concrete Using the Specific Ion Probe” as described in SHRP-S-330, Appendix F, “The Method of Field Determination of Total Chloride Content” as described in SHRP-S-328, Volume 6 or an approved equivalent test method. 	

500.4 DRAINAGE INFRASTRUCTURE

At the Expiry Date, the Drainage Infrastructure shall be in adequate condition and function as designed such that no action (i.e. physical works or remediation strategies) is required at the Expiry Date.

At the Expiry Date, when the Ministry assumes responsibility for the Drainage Infrastructure, it shall meet or exceed the requirements defined in Table 500-3.

Table 500-3: Handback Requirements – Drainage Infrastructure

Asset Category	Required Condition
All Drainage Infrastructure	<ul style="list-style-type: none"> • Meet the intended design and construction requirements. • Conformance with the condition requirements as set out in Section 402. • Conformance with Operations and Maintenance Section 401 and OPM’s met.
On Roadway Curb / Gutter	<ul style="list-style-type: none"> • RSL shall be the greater of the sum of the Minimum Required Design Life of the On Roadway Curb / Gutter less the age of the On Roadway Curb / Gutter at the Expiry Date or 20 years.
Under Roadway Culverts	<ul style="list-style-type: none"> • RSL shall be the greater of the sum of the Minimum Required Design Life of the Under Roadway Culvert less the age of the Under Roadway Culvert at the Expiry Date or 20 years.
Adjacent Roadway Ditch / Drainage Structures	<ul style="list-style-type: none"> • RSL shall be the greater of the sum of the Minimum Required Design Life of the adjacent roadway ditch / drainage structure less the age of adjacent roadway ditch / Drainage structure at the Expiry Date or 20 years.

500.5 ELECTRICAL INFRASTRUCTURE

At the Expiry Date, when the Ministry assumes responsibility for the Electrical Infrastructure, it shall meet or exceed the requirements defined in Table 500-4.

Where there are requirements in this Section that impact Intelligent Transportation Systems and there are conflicts with the requirements in other Sections and in this Schedule, the more stringent of the requirements shall apply.

Table 500-4: Handback Requirements – Electrical Infrastructure

Asset Category	Required Condition
Electrical Equipment	<ul style="list-style-type: none"> • Minimum required RSL of 8 years
Signal Controllers	<ul style="list-style-type: none"> • Minimum required RSL of 2 years
Power Supply Distribution Assemblies	<ul style="list-style-type: none"> • Minimum required RSL of 8years
Lighting Bulbs	<ul style="list-style-type: none"> • All lighting bulbs to be replaced within the 5 year period prior to the Expiry Date.
Renewable Items	<ul style="list-style-type: none"> • Expected operational life of at least 50% or more

Project Co shall provide the Ministry with any required supporting software. It must be in proper working order, not obsolete or incompatible with the current Ministry operating system at the Expiry Date and all third party software shall be the latest full release version with similar compatibility.

Project Co shall provide an inventory of Electrical Infrastructure 60 days prior to the Expiry Date and arrange with the Ministry, a final inspection of all electrical components to verify their physical condition and that they operate as designed per the Project Agreement requirements. The results of the inspection shall be included in the most current Annual APPM Achievement Report as outlined in Section 402.2.4.

500.6 INTELLIGENT TRANSPORTATION SYSTEM INFRASTRUCTURE

At the Expiry Date, when the Ministry assumes responsibility for the ITS Infrastructure, it shall meet or exceed the requirements defined in Table 500-5.

Where there are requirements elsewhere in this Section that impact Intelligent Transportation Systems and there are conflicts with the requirements in other Sections and in this Schedule, the more stringent of the requirements shall apply.

Table 500-5: Handback Requirements – ITS Infrastructure

Asset Category	Required Condition
CCTV Cameras	<ul style="list-style-type: none"> • Minimum required RSL of 2 years
VMS (including support structure)	<ul style="list-style-type: none"> • Minimum required RSL of 5 years
Controllers	<ul style="list-style-type: none"> • Minimum required RSL of 2 years
CCTV Poles	<ul style="list-style-type: none"> • Minimum required RSL of 10 years
Vehicle Detection System (VDS)	<ul style="list-style-type: none"> • Minimum required RSL of 2 years

Asset Category	Required Condition
Electronic Communications Equipment (modems, etc.)	<ul style="list-style-type: none"> • Minimum required RSL of 2 years
Communications Fibre Optic Cable	<ul style="list-style-type: none"> • Minimum required RSL of 15 years
WIM System and Components	<ul style="list-style-type: none"> • Minimum required RSL of 5 years

Project Co shall provide the Ministry with any required supporting software. It must be in proper working order, not obsolete or incompatible with the current the Ministry operating system at the Expiry Date and all third party software shall be the latest full release version with similar compatibility.

Project Co shall, 60 days prior to the Expiry Date, supply to the Ministry, two (2) sets of any special devices and systems required to carry out maintenance work and the following spare components:

- a) VMS – 10% of display modules, controllers and power supplies;
- b) CCTV – 10% of cameras, housing, lowering mechanisms, and control electronics;
- c) VDS – 10% of detector systems, mounting structures (if applicable) controllers and cabinets; and
- d) Communications – 10% of all electronic components.

Project Co shall provide an inventory of ITS Infrastructure 60 days prior to the Expiry Date and arrange with the Ministry, a final inspection of all ITS components to verify their physical condition and that they operate as designed per the Project Agreement requirements. The results of the inspection shall be included in the most current Annual APPM Achievement Report as outlined in Section 402.2.4.

500.7 OTHER MINOR ASSETS

At the Expiry Date, when the Ministry assumes responsibility for the highway appurtenance, the Bypass Infrastructure shall be in-place and functioning as designed.

Project Co must demonstrate throughout the Operational Term, via the Asset Management Plan established pursuant to Section 402 (Asset Preservation) to this Schedule 15 and the IMS Manual established pursuant to Schedule 14 - Integrated Management System, that it shall achieve or exceed at the Expiry Date, a state in which the assets perform as intended with no outstanding safety issues and a minimum required RSL of 1 year, with the exception of noise barriers, that shall have a minimum RSL of 10 years.

500.8 GENERAL REQUIREMENTS

500.8.1 Operations and Maintenance Manual

Project Co shall prepare an Operations and Maintenance Manual (OMM) (the “**Operations and Maintenance Manual**” or “**OMM**”) for Electrical and ITS Infrastructure such that the Bypass Infrastructure can be used and maintained by the Ministry after the Expiry Date. The OMM shall be provided to the Ministry at least 12 months prior to the Expiry Date. The OMM shall be sufficiently detailed to enable a person unfamiliar with the relevant Bypass Infrastructure to efficiently maintain and operate such special facility.

The OMM shall include comprehensive instructions to operate all aspects of the special facility detailing at a minimum the following content:

- a) The purpose and operational objectives of the Bypass Infrastructure;
- b) All necessary steps to safely operate such Bypass Infrastructure;
- c) Any hazards to avoid while operating such Bypass Infrastructure;
- d) Clear diagrams and/or photographs to illustrate the operational process; and
- e) Any separate component maintenance, installation and instruction manuals from the manufacturer;

The OMM shall identify all activities required to maintain the special facility condition and operation including inspections, pro-active component replacements, and routine maintenance, with specific instructions for:

- a) Daily requirements;
- b) Weekly requirements;
- c) Monthly requirements;
- d) Annual requirements; and
- e) History of maintenance services.

500.8.2 Inventory and Verification of Inventory

Project Co shall provide an updated Bypass Infrastructure inventory report, in accordance with the requirements of Section 401 (Operations and Maintenance) of this Schedule 15, plus a basic inventory of other Bypass Infrastructure and spare parts to be handed over to the Ministry at the Expiry Date, at least 60 days prior to the Expiry Date.

500.8.3 As-Built Drawings and Records

The most current and up-to-date versions of all As-Built Drawings prepared in connection with the Project shall be submitted to the Ministry at the Expiry Date in accordance with the requirements of Section 400.1.8 (Record As-Built Drawings).

Project Co shall provide other records and reports in accordance with the provisions of Schedule 13, Record Provisions.

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