TOWNSHIP OF CHAPLEAU

MUNICIPAL STRUCTURE INVENTORY AND INSPECTION - 2013

Prepared by:

AECOM

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Project Number:

60307882

Date:

December, 2013

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December 18th, 2013

Allan Pellow
Chief Administrative Officer
Township of Chapleau
20 Pine Street
Chapleau, Ontario
P0M 1K0

Dear Mr. Pellow:

Project No: 60307882

Regarding: Municipal Structure Inventory and Inspection 2013

AECOM is pleased to submit this report with the respect to the results of the 2013 Municipal Structure Inventory and Inspection which outlines the results of our field inspection investigations for the above noted project.

This study was completed for the Structure appraisals using Worktech's Asset Foundation Software. Structures were reviewed in accordance with the Municipal Bridge Appraisal Manual and Municipal Culvert Appraisal Manual.

With this report, all structure related data for those structures appraised in 2013 have been updated to present day values and the content of the report reflects conditions as of the time of the field data collection, in the fall of 2013 for the structure inventory.

We trust that this report will be beneficial to the Township of Chapleau in developing their asset management plans and wish to express appreciation for the opportunity for AECOM to participate in the work.

Sincerely,
AECOM Canada Ltd.

Rick Talvitie, P. Eng.
Manager, Northern Ontario
rick.talvitie@aecom.com

RT/jrep
Encl.

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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
-	DLB	December, 2013	Draft
1	JP	December, 2013	Final

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Stamp

Executive Summary

The Township of Chapleau 2013 Municipal Structure Inventory and Inspection Study provides a summary of structure condition ratings identified during rating surveys conducted by AECOM in 2013. All of the Township of Chapleau's structures of 3.0m span or greater were reviewed in 2013. The Township of Chapleau's total inventory of four (4) bridges, are included in this report.

Data collection and structure ratings were completed in accordance with the Municipal Bridge Appraisal and Municipal Culvert Appraisal Manuals and the Ontario Structure Inspection Manual. The scope of the report includes summaries of collected data, with discussion and analysis regarding same.

A total of four (4) bridge structures were appraised in 2013. Key items contained within the inspection report are summarized below:

- Cedar Street Bridge No. 3 has an existing load limit posting of 3 tonnes. The existing load limit can be retained.
- Four (4) bridges require rehabilitation at an estimated cost of ***$1,016,000***.
- One (1) bridge requires guide rail installation, extension or upgrades at a total cost of ***$34,000***. All NOW need guide rail requirement costs provided do not include the potential traffic control costs that may be incurred if the guide rail work is undertaken independent of other necessary works.
- A summary of the total structure construction and rehabilitation needs resultant from the 2013 Structure Inspection for the ten year period is estimated to be ***$1,016,000*** for the existing Township's structure system. Of this total cost ***$625,000*** are for NOW needs, ***$373,000*** are for structure 1-5 year needs and ***$18,000*** are for the 6-10 year needs.
- The average age of the Township's bridge structures is ***31.5*** years.

Recommended funding for the structure inventory would include sufficient capital expenditures that would allow the replacement of infrastructure as it meets its design life.

For new structures, the design lifespan is now 75 years; however, structures constructed prior to 2000 were generally designed for a 50 year lifespan. Accordingly between 1.5% and 2.0% of the value of the entire structure inventory should be expended annually to ensure that the structure inventory can be maintained in perpetuity. It is noted that as the structures are replaced, the annual allocation could be reduced to 1.5%.

Based on the aforementioned and the data included in this report, the estimated minimum annual capital program for structures should be in the amount of ***$170,000*** per year for the Township of Chapleau to maintain the current system adequacy. However, given the average age of the Township of Chapleau's structures inventory, it is quite probable that expenditures on structures will be even higher than estimated over the next decade as the older structures reach a terminal condition.

All costs contained within the structure appraisal reports include engineering and contingencies, and are based on 2013 construction dollars.

Rehabilitation and replacement recommendations are provided within this report. The costs associated within these recommendations should be budgeted above and beyond the recommended replacement budget to maximize the service life of the structures.

Completion of the 2013 re-inspection of four (4) bridge structures on the Township's road system has resulted in reliable and current data being available to the Township to implement a maintenance program ensuring the Township's structures are kept safe and in good repair. Maintenance of the Bridge and Culvert Management Program will require updating of databases on an on-going annual basis to reflect previous year rehabilitation/replacement project updates. It is recommended that the structures be re-inspected under the direction of a qualified structural engineer every two (2) years.

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Appendices

1. Introduction

The Township of Chapleau 2013 Municipal Structure Inventory and Inspection Study provides a summary of structure condition ratings identified during rating surveys conducted by AECOM in 2013. All of the Township of Chapleau's structures of 3.0m span or greater were reviewed in 2013. The Township of Chapleau's total inventory of four (4) bridges, have been included in this report.

The Province of Ontario passed amendments in 1997 to existing legislation in the Highway Traffic Act (HTA), The Bridge Act (BA) and the Public Transportation and Highway Improvement Act (PTHIA) that required all bridge, culvert and retaining wall structures with a span greater than 3.0m to be inspected under the direction of a Professional Engineer at no greater than two (2) year intervals. The inspection methodology and reporting must be in accordance with the Ontario Structure Inspection Manual (or equivalent).

Data collection and structure ratings were completed in accordance with the Municipal Bridge Appraisal and Municipal Culvert Appraisal Manuals and the Ontario Structure Inspection Manual.

The scope of the report includes summaries of collected data, with discussion and analysis regarding same.

Also under the new regulations, municipalities are still responsible for passing load limit bylaws. In place of the MTO review, engineering recommendations to support the load limit and the duration for which it is valid, must now be stamped by two (2) professional engineers.

AECOM Canada Ltd. was retained by the Township of Chapleau to re-inspect a total of four (4) bridge structures on the Township's road system and prioritize the maintenance, repair and replacement works for these structures.

AECOM Canada Ltd. has completed the structure appraisals using WorkTech's Asset Foundation Software.

The procedures used to carry out this 2013 structure inventory are explained in detail in the following manuals published by the Ministry of Transportation and Municipal Engineers Association.

a) **Municipal Bridge Appraisal Manual**
February 1992

b) **Municipal Culvert Appraisal Manual**
August 1993

c) **Ontario Structure Inspection Manual 2000 (OSIM)**
Revised (Nov 2003 and Apr 2008)

This report documents the visual inspection and recommendations for the maintenance, repair or replacement (MR&R) of the structures.

2. Scope of Work

The assignment included an assessment of four (4) bridges which are currently identified on the Township of Chapleau's Road System. The work involved the following tasks:

1. A visual re-inspection for deficiencies and the recording of any relevant dimensions.

2. An updated photographic inventory of the structure appearance and deficiencies.

3. The compilation of the field review using Worktech Asset Foundation Software.

4. An individual assessment of the condition and state of repair/non-repair of each structure, as well as the recommendation of improvements and estimated costs to bring the existing structure to an acceptable level-of-service.

5. Recommendation of the feasible options and cost-effectiveness of maintaining the existing structure versus possible replacement and the costs and timing of the same.

6. Development of a spread sheet program to determine various condition and appraisal ratings for each structure. The program includes an algorithm to determine an Overall Condition Rating, Functional Needs Rating and Overall Rating for each structure as outlined in ***Appendix D***. Relative rankings of bridge and culvert needs have also been provided.

7. Identification of specific budget recommendations for detailed condition surveys and bridge rehabilitation/replacement including associated engineering design and supervision and construction estimates.

3. Structure Categorization

The following definitions were used in the preparation of the Bridge and Culvert Appraisal Sheets:

Bridge - In general, transfers all live loads through a superstructure to a substructure and foundations. Bridges that were originally designed as a bridge and have some depth of fill placed over the deck have been appraised as a bridge.

Box or open type structure having less than 600 mm of cover have been appraised as a bridge and those with more than 600 mm of cover have been appraised as a culvert.

Culvert - In general, transfers all live loads through fill.

4. Structure Appraisals and Identification of Maintenance, Repair and Replacement Needs

A total of four (4) bridge structures were appraised in 2013. The results of our inspection and recommendations are summarized on the Municipal Bridge Appraisal Sheets which are provided in ***Appendix E***. A summary of the results of the inspection and appraisal program for all bridge structures has been presented in ***Appendices B***. ***Appendix B*** contains a list of the four (4) bridges inventoried.

Based on a review of our inspection findings, recommendations and cost estimates were developed for structures which required maintenance, repair or replacement as shown in the Recommended Needs section of the structure appraisal sheets. ***Table B1*** included in ***Appendix B*** summarizes basic structure data for all bridge needs identified through the structure appraisal. The priority ranking of the bridges based on the results of the Bridge Management System are also shown. Of the four (4) bridge structures that were appraised in 2013, recommendations are summarized in ***Sections 4.1 to 4.4*** of this report.

All costs contained within the structure appraisal reports include engineering and contingencies, and are based on 2013 construction dollars.

4.1 Load Limit Bylaws

L3 postings govern single unit vehicles; L2 postings govern two unit vehicles; and L1 postings govern vehicle trains. Section 13 of Bill 92 amends Section 123 of the Highway Traffic Act dealing with the load limit by-laws. Municipalities retain the authority to pass load limit by-laws, but approval of the Minister of Transportation is no longer required. Two engineer's stamps for all load limit by-law recommendations, including load posting and duration, generally 2 years, are now required. Load posting assessments are currently being carried out during the annual bridge appraisal updates. Load limit recommendations are summarized in ***Table 1***. There is one (1) bridge that requires a load limit recommendations at this time.

Table 1 Load Limit Recommendations

Load Limit Recommendations							
Structure No.	Location	Existing Load Limit			Recommended Load Limit		
		L3	L2	L1	L3	L2	L1
3	*CEDAR STREET BRIDGE, CEDAR STREET, 0.01 km E of GREY STREET*	*3*	-	-	*3*	-	-

4.2 Engineering Investigations

There is one (1) bridge designated for further engineering investigations to confirm visual repair recommendations as summarized in ***Table 2***. It is recommended that engineering investigations be completed within 2 to 4 years prior to structure rehabilitations.

Table 2 Engineering Investigations

Engineering Investigations				
Structure No.	**Location**	**Recommended Engineering Investigation**	**Cost for Budget Purposes**	**Estimated Rehabilitation Cost**
-	-	-	-	-

4.3 Structure Removal

- There are no bridges designated for removal at this time.

4.4 Structure Replacements

- There are no bridges designated for replacement at this time.

4.5 Structure Rehabilitations

- Four (4) bridges require rehabilitation, as identified in ***Table 5*** at a total cost of ***$1,016,000.*** They are presented in order of priority as determined from the Bridge Improvement Priority Program.
- One (1) bridge requires guide rail installation, extension or upgrades as identified in ***Table 7*** at a total cost of ***$34,000.***
- Overall Structure Inventory with priority rankings for all bridge structures has been identified in ***Table 8.***

Table 3 Structure Removal

Bridge Removal 2013							
Bridge No.			Reason for Improvement	Service Life			
-	-	-	-	-	-	-	-

Culvert Removal - 2013							
Culvert No.			Reason for Improvement	Service Life			
-	-	-	-	-	-	-	-

Table 4 Structure Replacements

Bridge Replacements – 2013							
Bridge No.							
-	-	-	-	-	-	-	-

Culvert Replacements - 2013							
Culvert No.	Priority	Location	Reason for Improvement	Estimated Remaining Service Life	Impact of Deferral	Interim Works to Extend Life	Replacement Cost
-	-	-	-	-	-	-	-

Table 5 Structure Rehabilitations – Bridges

Bridge Rehabilitation Needs by Priority Ranking 2013					
Bridge No.	**Priority**	**Bridge Name**	**Location**	**Recommended Work**	**Rehabilitation Cost**
Rehabilitations					
3	*1*	*CEDAR STREET BRIDGE*	*CEDAR STREET, 0.01 km E of GREY STREET*	*Replace (or splice) decayed timber piles (refer to timber inspection report), repair decayed crib timber members in the 1st pier from the east.*	*$289,000*
1	*2*	*MONK STREET BRIDGE*	*MONK STREET, 0.2 km N of PINE STREET*	*Replace bearing pads at the abutments, repair or replace expansion joints or install semi-integral joint system, patch barrier walls, girders, repair de-bonded patches at diaphragms. Short term repairs would include restraining bearings, replacement of expansion joint seals and provision of continuous cover plates (not costed).*	*$574,000*
4	*3*	*PEDESTRIAN BRIDGE*	*OVER MONK STREET, 0.20 km S of MONK STREET BRIDGE*	*Repair diaphragms and replace abutment bearings.*	*$76,000*
2	*4*	*LISGAR STREET BRIDGE*	*LISGAR STREET, 0.30 km N of MONK STREET*	*Repair ends of girders, end diaphragms and expansion joint end dams*	*$77,000*

Table 6 Structure Rehabilitations – Culverts

Culvert Rehabilitation Needs by Priority Ranking 2013					
Culvert No.	**Priority**	**Culvert Name**	**Location**	**Recommended Work**	**Rehabilitation Cost**
Rehabilitations					
-	*-*	*-*	*-*	*-*	*-*

Table 7 Summary of NOW Guide Rail Requirements

Older structures often lack approach guide rail or incorporate approach guide rail systems with buried or terminal ends that are considered to be deficient relative to current standards for end treatments. Additionally, railing systems on older structures often require augmentation with guide rail type systems installed in front of the railings. There is one (1) bridge that requires guide rail installation, extension or upgrades as identified in ***Table 7***at a total cost of ***$34,000***.

Bridge Guide Rail Requirements 2013				
Bridge No.	**Bridge Name**	**Location**	**Recommended Work**	**Estimated Cost**
2	*LISGAR STREET BRIDGE*	*LISGAR STREET, 0.30 km N of MONK STREET*	*Upgrade guide rail end treatments*	*$34,000*

Culvert Guide Rail Requirements 2013				
Culvert No.	**Culvert Name**	**Location**	**Recommended Work**	**Estimated Cost**
-	-	-	-	-

All guide rail requirement costs provided do not include the potential traffic control costs that may be incurred if the guide rail work is undertaken independent of other necessary works.

Table 8 Overall Structure Inventory

Overall Bridge Inventory - 2013				
Bridge No.	**Priority**	**RSL**	**Bridge Name**	**Location**
1	*2*	*50*	*MONK STREET BRIDGE*	*MONK STREET, 0.2 km N of PINE STREET*
2	*4*	*50*	*LISGAR STREET BRIDGE*	*LISGAR STREET, 0.30 km N of MONK STREET*
3	*1*	*27*	*CEDAR STREET BRIDGE*	*CEDAR STREET, 0.01 km E of GREY STREET*
4	*3*	*50*	*PEDESTRIAN BRIDGE*	*OVER MONK STREET, 0.20 km S of MONK STREET BRIDGE*

RSL – Remaining Service Life has been based on the assumption that structures are adequately maintained in accordance with the recommendations contained within our report.

4.6 Monitoring

- There are no bridges at this time that require any on-going monitoring to ensure safety and serviceability.

Table 9 Monitoring

Monitoring		
Structure No.	**Location**	**Monitoring Requirements**
-	-	-

5. Structure Inventory and Construction Needs Summary

- ***Table 10*** which follows provides a summary of the total structure construction and rehabilitation needs resultant from the 2013 Structure Inspections. For the ten year period, the rehabilitation needs are estimated to be ***$1,016,000*** for the existing Township's structure system. Of this total cost ***$625,000*** are for NOW needs, ***$373,000*** are for structure 1-5 year needs and ***$18,000*** are for the 6-10 year needs.

Table 10 Bridge Improvement Needs Summary

Not Adjusted for Owners Share ($)				
Const	*0.00*	*0.00*	*0.00*	***0.00***
Const Extra				
Inspection		*0.00*	*0.00*	***0.00***
Rehab				
Rehab Extra		*178,000.00*	*9,000.00*	***196,000.00***
Total				

Adjusted for Owners Share ($)				
	NOW	**1-5**	**6-10**	**Total**
Const	*0.00*	*0.00*	*0.00*	***0.00***
Const Extra	*0.00*	*0.00*	*0.00*	***0.00***
Inspection	*0.00*	*0.00*	*0.00*	***0.00***
Rehab	*616,000.00*	*195,000.00*	*9,000.00*	***820,000.00***
Rehab Extra	*9,000.00*	*178,000.00*	*9,000.00*	***196,000.00***
Total	***625,000.00***	***373,000.00***	***18,000.00***	***1,016,000.00***

5.1 Structure Inventory Replacement Value

Table 11 (below) provides a conservative estimate of structure replacement costs on a per structure basis. The costs have been prepared based on weighted average of each structure type from the municipal database. The values shown in ***Table 11*** include the construction costs based on the costs obtained from recent contracts, and adjustments factors including basic construction, contingency, engineering, and terrain type. The cost of structures is more variable than the cost of the road construction as factors such as the roadside environment, the feature the structure is spanning, construction material, and anticipated lifespan influence the costing to a greater degree.

Table 11 Structure Replacement Value

Structure Type	Range of Replacement Values	Average Replacement Value
Bridge		
Culvert	-	-

6. Normal Structure Maintenance

A summary of normal structure maintenance for all bridge and culvert structures has been presented in ***Table 12*** (below) as a result of the 2013 re-inspections.

Table 12 Normal Structure Maintenance Summary

Bridge Maintenance		
Bridge No.	**Location**	**Maintenance Requirements**
1	*MONK STREET BRIDGE, MONK STREET, 0.2 km N of PINE STREET*	*Clean catch basins, deck drains, reposition parapet rails, replace junction box covers and replace missing end caps*
2	*LISGAR STREET BRIDGE, LISGAR STREET, 0.30 km N of MONK STREET*	*Re-attach deck drain in southeast corner, clean out catch basins and deck drain*
3	*CEDAR STREET BRIDGE, CEDAR STREET, 0.01 km E of GREY STREET*	*Replace missing nuts and washers on all timber pile cross bracing connections, stabilize the embankment with rock protection at the front of the north abutment, grade approaches and remove vegetation from under bridge*
4	*PEDESTRIAN BRIDGE, OVER MONK STREET, 0.20 km S of MONK STREET BRIDGE*	*Recaulk joint at east expansion joint seal to drain pipe*

7. Recommended Program Funding Levels

Recommended program funding level calculations are typically based on the length of or number of the infrastructure types and average widths of same within the database.

It should be noted that the budgetary recommendations in this report do not include items in the budget related to development and growth. Those items are in addition to the recommendations in this report and should require another funding source.

7.1 Capital Replacements

Recommended funding for the structures inventory would include sufficient capital expenditures that would allow the replacement of infrastructure as it meets its design life.

For new structures, the design lifespan is now 75 years; however, structures constructed prior to 2000 were generally designed for a 50 year lifespan. Accordingly between 1.5% and 2.0% of the value of the entire structure inventory should be expended annually to ensure that the structure inventory can be maintained in perpetuity. It is noted that as the structures are replaced, the annual allocation could be reduced to 1.5%.

The average age of the Township's bridge structures is ***31.5*** years.

Based on the aforementioned and the data shown in ***Section 4*** of this report, the estimated minimum annual capital program for structures should be in the amount of ***$170,000.00*** per year for the Township of Chapleau to maintain the current system adequacy. However, given the average age of the Township of Chapleau's structures inventory, it is quite probable that expenditures on structures will be even higher than estimated over the next decade as the older structures reach a terminal condition.

7.2 Major Maintenance

Rehabilitation and replacement recommendations are provided within this report ***(see section 4)***. The costs associated within these recommendations should be budgeted above and beyond the recommended replacement budget suggested in ***Section 7.1*** to maximize the service life of the structures.

8. Conclusions

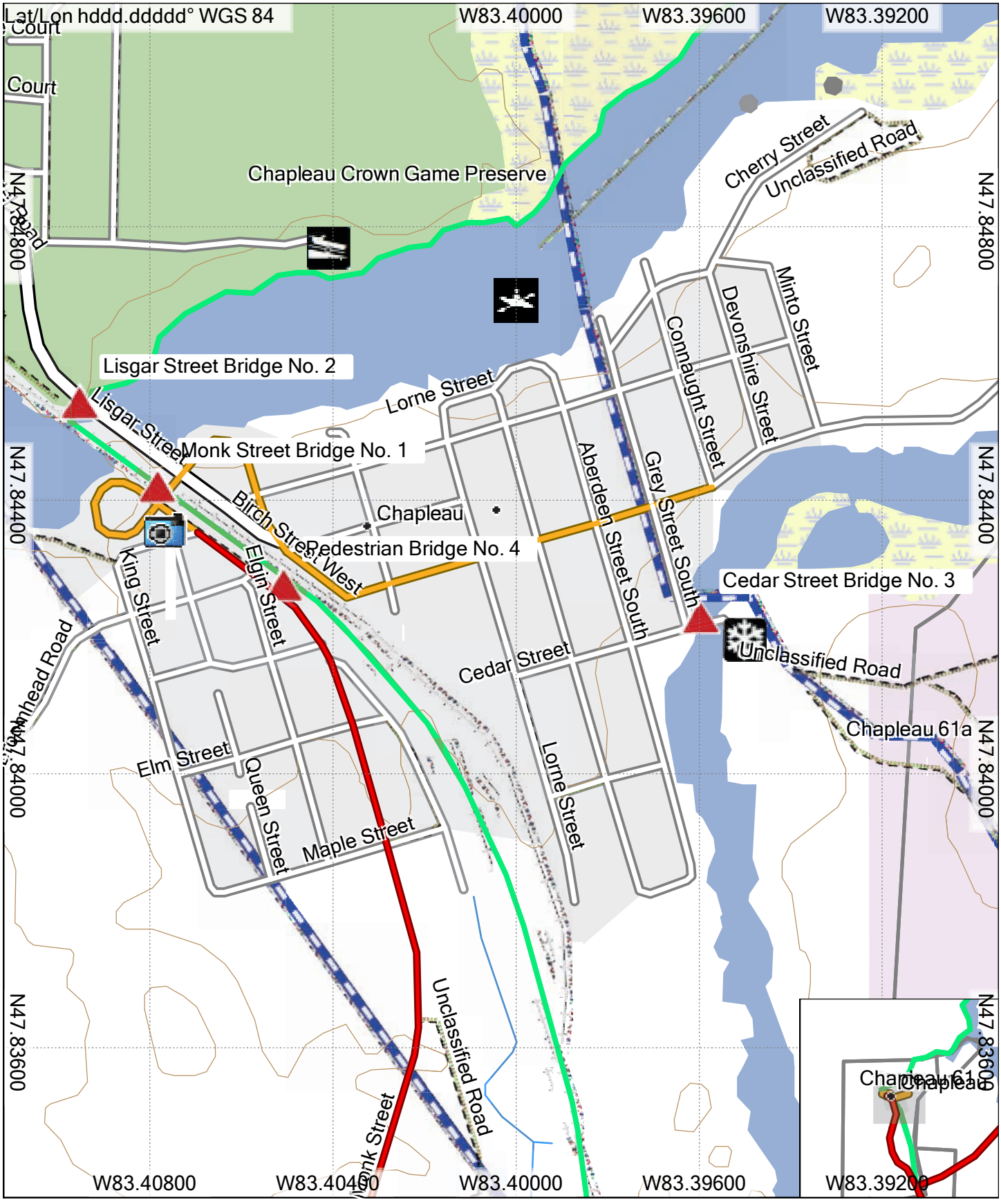
Completion of the 2013 re-inspection of the four (4) bridge and culvert structures on the Township's road system has resulted in reliable and current data being available to the Township to implement a maintenance program ensuring the Township's structures are kept safe and in good repair.

Maintenance of the Bridge and Culvert Management Program will require updating of the database on an on-going annual basis to reflect previous year rehabilitation/replacement project updates. It is recommended that the structures be re-inspected by a qualified structure engineer every two (2) years.

We trust that the foregoing will assist you in implementing a cost effective structure maintenance, repair and replacement program.

Appendix A

Key Plans



Township of Chapleau

Appendix B

Bridge Improvement Needs

Township of Chapleau
Bridge Improvement Needs

Data Last Refreshed December 18, 2013
9:39:18AM

Bridge No.	Priority	Bridge Name	Road Name	Location	Const. Yr Sub/ Super	Ex. Load Posting L3t	L2t	L1t	Crossing Type	No. of Spans	Deck Length (m)	Deck Width (m)	Eng. Invest. Type/ Cost ($)	Improvement Recommendations Category	Type	TON	Cost(1)
3	1.00	CEDAR STREET BRIDGE	CEDAR STREET	0.01 km E of GREY STREET	1970 1990	3	0	0	O-WAT, Over	7	40.50	5.80		Rehab	RSB	NOW	280,000
														Rehab Extra	brTCP	NOW	9,000
															Total Cost	**NOW**	**289,000**
														Maintenance	OTHm	1-5	0
															Total Cost	**1-5**	**0**
															Total Cost		**289,000**
															Municipal %		100
															MunicipalCost		**289,000**
1	2.00	MONK STREET BRIDGE	MONK STREET.	0.2 km N of PINE STREET	1973 1973	0	0	0	O-R/R, Over road	5	107.80	12.20		Rehab	BIR	NOW	169,000
														Rehab	TJR	NOW	167,000
															Total Cost	**NOW**	**336,000**
														Maintenance	OTHm	1-5	0
														Rehab	RIR	1-5	17,000
														Rehab	RSB	1-5	9,000
														Rehab	RSP	1-5	34,000
														Rehab Extra	brTCP	1-5	169,000
															Total Cost	**1-5**	**229,000**
														Rehab Extra	brTCP	6-10	9,000
															Total Cost	**6-10**	**9,000**
															Total Cost		**574,000**
															Municipal %		100
															MunicipalCost		**574,000**
4	3.00	PEDESTRIAN BRIDGE	OVER MONK STREET	0.20 km S of MONK STREET BRIDGE	1980 1980	0	0	0	O-RD, Over	2	59.27	3.20		Maintenance	OTHm	1-5	0
														Rehab	BIR	1-5	67,000
															Total Cost	**1-5**	**67,000**
														Rehab	RSP	6-10	9,000
															Total Cost	**6-10**	**9,000**
															Total Cost		**76,000**
															Municipal %		100
															MunicipalCost		**76,000**

Notes:
1. Cost includes engineering and contigency allowances.
2. Total cost includes cost of engineering investigations. Total cost is not adjusted for owner share.

Bridge No.	Priority	Bridge Name	Road Name	Location	Const. Yr Sub/ Super	Ex. Load Posting			Crossing Type	No. of Spans	Deck Length (m)	Deck Width (m)	Eng. Invest.	Improvement Recommendations			
						L3t	L2t	L1t					Type/ Cost ($)	Category	Type	TON	Cost(1)
2	4.00	LISGAR STREET BRIDGE	LISGAR STREET	0.30 km N of MONK STREET	1983 1983	0	0	0	O-WAT, Over	1	25.30	11.80		Maintenance	OTHm	1-5	0
														Rehab	IAG	1-5	34,000
														Rehab	RSP	1-5	17,000
														Rehab	TJM	1-5	17,000
														Rehab Extra	brTCP	1-5	9,000
															Total Cost	**1-5**	**77,000**
															Total Cost		**77,000**
															Municipal %		100
															MunicipalCost		**77,000**

Total Cost of Recommended Improvements (2)

Notes:
1. Cost includes engineering and contigency allowances.
2. Total cost includes cost of engineering investigations. Total cost is not adjusted for owner share.

BRIDGE IMPROVEMENT NEEDS

The bridges of span 3.0m and greater under the jurisdiction of the Township of Chapleau which were inventoried and appraised are listed in the following table. The bridge inventory section table is arranged numerically by bridge number and provides the following information:

- Local bridge number
- Priority Ranking
- The bridge name
- The bridge locations
- The year of substructure and superstructure construction
- Existing Load Limit Postings
- The crossing type
- The number of spans
- The deck length and deck width
- The requirement for any engineering investigation, year and cost
- The recommended type and time of improvement
- The construction cost of the recommended improvement and the total project cost including engineering and contingency allowances

The following abbreviations are used in Table B1:

bc - Bridge Construction
br - Bridge Rehabilitation

Crossing Type

O-WAT - Over Water
U-RWY - Under Railway
O-RWY - Over Railway

Engineering Investigations

SEI	Seismic Investigation
UI	Underwater Investigation
RDI	Routine Detailed Inspection
STI	Structure Investigation
RRA	Rehabilitate/Replace Analysis
LCE	Load Capacity Evaluation
C/S	Condition Survey of Other Components
CN/I	Condition Inspection
DART	DART Survey
DCCS	Detail Coating Condition Survey
DCS	Deck Condition Survey
FI	Fatigue Investigation

Type of Improvements

- ### Capital Improvements / Construction Extra

NEW	New bridge
RBC	Replace Bridge with Culvert
REB	Remove Existing Bridge
RNL	Replace Bridge - New location
RSL	Replace Bridge - Same location
TEB	Twin Existing Bridge
bcApp	Approaches
bcTCP	Traffic Control/Protection
bcUTI	Utility Relocation
bcROW	Right of Way costs
bcENV	Environmental Study Costs
bcDET	Detours

- ### Bridge Rehabilitation Improvements / Rehabilitation Extra

RSP - Rehabilitate Superstructure
RSB - Rehabilitate Substructure
RRW - Rehabilitate/Replace Retaining Walls
RIR - Railing Improvement/Replacement

- ### Deck Rehabilitation Improvements

WSR - Wearing Surface Rehabilitation
CDR - Complete Deck Replacement
OWP - Overlay, Waterproof and Pave
PWP - Patch, Waterproof and Asphalt Paving
CDS - Concrete Deck Soffit Repairs
CR - Concrete Repairs
PDR - Partial Deck Replacement
RCS - Rehabilitation/Replacement of Safety Curbs/Sidewalk
TJM - Transverse Exp Joint Modification
TJR - Transverse Expansion Joint Replacement
TJS - Transverse Expansion Joint Seal Replacement
LMC - Latex Modified Concrete Overlay
LJM - Longitudinal Exp Joint Modification
LJR - Longitudinal Exp Joint Replacement
LJS - Longitudinal Exp Joint Seal Replacement

- ### Bridge Coating Improvements

CSR - Coating Steel Railings
CSS - Coating Structural Steel

- **Bridge Bearing Improvements**

BIR - Bearing Improvement/Replacement

- **Stream/Waterway Improvements**

SPI - Scour Protection Improvements
C/I - Channel Improvements
C/R - Channel Realignment
EIR - Embankment Improvement/Rehab

- **Safety Improvements**

IAG - Installation of Approach Guide rail
IAB - Install Approach Safety Shape Barrier

- **Non Standard Improvements**

OTHm - Maintenance Improvements
OTHr - Rehabilitation Improvements

- **Costing Category**

PC - Preliminary Cost Estimate

Appendix C

Culvert Improvement Needs

CULVERT IMPROVEMENT NEEDS

The culverts of span 1.4 m and greater under the jurisdiction of the Township of Chapleau which were inventoried and appraised are listed in the following table. The culvert inventory section table is arranged numerically by culvert number and provides the following information:

- Local culvert number
- Priority Ranking
- The culvert name
- The culvert road name
- The culvert location
- The year of construction
- The year extended
- Load Limit Postings
- The crossing type
- The number of cells
- The total span in metres
- The culvert length
- The requirement for any engineering investigation, year and cost
- The recommended type and time of improvement
- The construction cost of the recommended improvement and the total project cost including engineering and contingency allowances

The following abbreviations are used in Table C1:

c -	Culvert
cc -	Culvert Construction
cr -	Culvert Rehabilitation

Crossing Type

O-WAT -	Over Water
O-PED -	Over Pedestrian Walkway

Culvert Type

CPS-PA/ -	Corrugated Plate Steel Pipe Arch
CPS-PR/ -	Corrugated Plate Steel Pipe Round
CPS-PAS -	Corrugated Plate Steel Pipe Arch with Stiffener and/or Buttress
CPS-PHS -	Corrugated Plate Steel Pipe Horizontal Ellipse with Stiffener and/or Buttress
CPS-PHE -	Corrugated Plate Steel Pipe Horizontal Ellipse
CPR-OTH -	Cast-in-Place Reinforced Concrete Other
CPR-BOX -	Cast-in-Place Reinforced Concrete Box
CPR-FRA -	Cast-in-Place Replacement Concrete Frame
PCC-PR/ -	Precast Concrete Pipe Round
CST-PA/ -	Corrugated Steel Pipe Arch
CST-PR/ -	Corrugated Steel Pipe Round

Type of Improvements

- ### Capital Improvements / Construction Extra

cREC - Remove Existing Culvert
cRSL - Replace Culvert, Same Location
ccAPP - Approaches
ccDET - Detours
ccTCP - Traffic Control / Protection
ccUTI - Utility Relocation
ccROW - ROW Costs
ccENV - Environmental Study

- ### Rehabilitation Improvements / Rehabilitation Extra

cRRW - Rehabilitate/Replace Retaining Walls/Wingwalls
cRSP - Rehabilitate Superstructure
cRSB - Rehabilitate Substructure
cRIO - Rehabilitate Inlet/Outlet Treatment
cRCF - Rehabilitate Culvert Floor/Invert
crAPP - Approaches
crDET - Detours
crTCP - Traffic Control / Protection
crUTI - Utility Relocation
crROW - ROW Costs
crENV - Environmental Study

- ### Stream/Waterway Improvements

cEIR - Embankment Improvements/Rehabilitation
cSPI - Scour Protection Improvements
cC/R - Channel Realignment
cCH/I - Channel Improvements

- ### Safety Improvements

cIAG - Installation of Approach Guide rail

- ### Costing Category

cPC - Preliminary Cost Estimate

Appendix D

Bridge and Culvert Management Program

BRIDGE AND CULVERT MANAGEMENT SYSTEM

In order to provide the Township of Chapleau with a means to evaluate future maintenance, repair and replacement needs based on updated inspection information, a Bridge & Culvert Management System was developed. The results produced by the program were determined from the following input data for each structure:

- Bridge (or Culvert) Needs ratings (MCR and PCR) identified in Section G of the Municipal Bridge (or Culvert) Appraisal Sheets.
- Functional needs identified in Section H of the Municipal Bridge (or Culvert) Appraisal Sheets.
- Load posting.
- Vehicular traffic at the structure site (AADT).

The following discusses the methodology used in the Bridge & Culvert Management System to determine various condition and appraisal ratings:

1. Material Condition and Performance Condition Ratings (MCR & PCR) in Section G of the Appraisal sheets for bridges and culverts have been input for each structure. The Ontario Structure Inspection Manual (published by the Ministry of Transportation, Ontario), requires that inspectors assign condition ratings from 1 to 6 with 6 representing the best condition. Additional ratings of 9, 0 and Y may also be used. The following table presents the rating values assumed by the program when these ratings are assigned:

MCR OR PCR RATING	ASSUMED RATING VALUE
9 - Component cannot be inspected	6
0 - Component does not exist; Need does not exist	6
Y - Component does not exist; Need exists	1.5

2. The Functional Needs information is included in Section H of the Municipal Bridge and Culvert Appraisal sheets. In cases where data is missing, the program assumes values. Rating values are determined by comparing the Existing Condition information with the Minimum Tolerable requirement. Table 1 presents the ratings assigned by the program for bridges, when the Existing Condition is worse than the Minimum Tolerable. Table 2 presents the assigned rating values for culverts.

Table 1 Functional Needs Ratings for Bridges

Functional Needs	Ratings	
	If Adequate	If Not Adequate
Road Over		
Travel Deck Width	6	2
Level of Service	6	2
Min.Vert. Clearance	6	1
Sidewalks	6	2
Road Under		
Surface Width	6	2
Level of Service	6	2
Min.Vert. Clearance	6	1
Sidewalks	6	2

Table 2 Functional Needs Ratings for Culverts

Functional Needs	Ratings	
	If Adequate	If Not Adequate
Road Over		
Platform Width	6	2
Level of Service	6	2
Roadside Safety	6	1
Road Through		
Surface Width	6	2
Level of Service	6	2
Min.Vert. Clearance	6	1
Sidewalks	6	2

3. For each rated structural component, an Overall Component Condition Rating is calculated by the program, using the following weight factors for the input MCR and PCR.

Overall Component Condition Rating Weights	
MCR	0.4
PCR	0.6

4. Load Posting Ratings are assigned using the following comparisons:

Condition	Assigned Load Posting Rating
If Load Posting is greater than 20 tonnes	6
If Load Posting >18 tonnes and # 20 tonnes	5
If Load Posting >16 tonnes and # 18 tonnes	4.5
If Load Posting >14 tonnes and # 16 tonnes	4
If Load Posting >12 tonnes and # 14 tonnes	3
If Load Posting >10 tonnes and # 12 tonnes	2
If Load Posting # 10 tonnes	1

Appendix E

Structure Appraisal Sheets

MUNICIPAL BRIDGE APPRAISAL

A. IDENTIFICATION

Bridge Name:	MONK STREET BRIDGE			Bridge No.:	1
Road Name:	MONK STREET.			Road Section No.	
Location:	0.2 km N of PINE STREET			MTO Site No.:	
Roadside Env.:	R	Posting Sign:	t t t	Crossing Type:	O-R/R, Over road and ra
BL Posting:	t t t	Low Clear Sign:	Narrow Structure Sign:	Federal Navigable Waterway:	Unknown
Bylaw No.:		Easting:	17 319854	Bridge Value:	$ 5,242,000
Bylaw Exp. Date:		Northing:	5301792	Old ID:	

B. RAILWAY OVERPASS/UNDERPASS

Railway Level Crossing Number:		Original Board Order Number:	
Railway Company:	CPR	Date:	
Railway Subdivision:	WhiteRiver	Current Board Order Number:	
Subdivision Mileage:	0.29	Date:	
Transport Canada Crossing No.:		Seniority:	
Number of Tracks:	2		

C. JURISDICTION

Owner:	88606	Special Designation:		**Local / Area Municipality (Upper Tier Only)**	
Owner Share:	100.00 %	Designation 2		Geo Area	Select Area
☐ Shared?		Adjacent Bridge No.:		Insp Area	Select Area
Shared With:				Patrol:	Select Area
Heritage Status:	R				

D. EXISTING CONDITIONS

Substructure Yr:	1973	Span Length:	25.9 m	Longitudinal Joints:	0
Superstructure Yr:	1973	Deck Type:	CC - Concrete, Cast in Place	Transverse Joints:	2
Bridge Type:	P - IB - L	Deck Length:	107.8 m	Number of Bearings:	60
Crossing Skew:	0 °	Deck Width:	12.2 m	Soil Condition:	G
Number of Spans:	5	Deck Area:	1,315.2 m^2	Abutment and Foundation Type:	Open - CO

ROAD OVER BRIDGE

Existing Road Class:	L/R	No. of Lanes:	2.0	Barrier Walls/Railings:	CP
Operational Status:	2W - OAT	Median Type/Width:	m	Min Vertical Clearance:	m
Wearing Surface:	A	Safety Curb/	(A) N N 0.6 m		
Travel Deck Width:	10.40 m	Sidewalk and Curb	(B) N / S 0.6 m		

ROAD UNDER BRIDGE

Existing Road Class:		No. of Lanes:	2	Traffic Barrier:	NO
Operational Status:	2W - OAT	Median Type/Width:	m	Min Vertical Clearance:	4.65 m
Opening Under:	24.1 m	Safety Curb/	(A) N E 1.5 m		
Surface Width:	9.8 m	Sidewalk and Curb	(B) N / W 1.5 m		

E. TRAFFIC DATA

Legal Speed Limit: 50

Route Designations

☐ Bus ☐ Truck Route
☒ School ☐ Bike Route

Source:
Bridge 1 Asset Master

Traffic Count		10 Year Traffic Forecast	
Year:	0	Year:	10
AADT:		AADT:	
DHV Factor:	%	DHV Factor:	%
DHV:	vph	DHV:	vph
Trucks:	%	Trucks:	%
Peak Directional Split:	%	Capacity:	0 vph
10 Year Growth Factor:		20 Year AADT:	0

F. INSPECTIONS

Date: 9/17/2013 Inspected By: Landon Plazek Approved By: D. Baxter, P.Eng.

Municipality: Township of Chapleau Bridge No.: 1

G. BRIDGE NEEDS

Field	MCR	PCR	TON	Comments
Superstructure	4	3	1-5	
Wearing Surface	6	6	ADEQ	
Deck Condition	5	6	6-10	
Expansion Joints	1	1	NOW	
Railings	4	5	1-5	
Substructure	4	5	1-5	
Coating	0	0	ADEQ	
Streams/Waterways	0	0	ADEQ	
Curb/Sidewalk	5	6	6-10	

H. FUNCTIONAL NEEDS

Field	Existing	Min Tolerable	Time of Need	Comments
Road Over Bridge				
RO-Trav. Deck Width	10.4	6	ADEQ	Proj Class: 100, 0 (10 YR, 0*1)
RO-LOS	A	E	ADEQ	
RO-Min. Vertical Clear.		4.5	ADEQ	No value for: Min Vertical Clearance
RO-Sidewalks	Y	N	ADEQ	

Recommended Needs

Impr.Class	Improvement	Description	Time of Need	Year	Base/ Const Cost	Eng/Cont	Total
Maintenance	OTHm	Maintenance Improvement	1-5	0	0	0	0
		Maintenance Subtotal:			0	0	0
Rehab	RIR	Railing Improvement/Replacement	1-5	0	13,000	4,000	17,000
Rehab	RSB	Rehabilitate Substructure	1-5	0	7,000	2,000	9,000
Rehab	RSP	Rehabilitate Superstructure	1-5	0	26,000	8,000	34,000
Rehab	BIR	Bearing Improvement/Replacement	NOW	0	130,000	39,000	169,000
Rehab	TJR	Transverse Exp Joint Replacement	NOW	0	128,000	39,000	167,000
		Rehab Subtotal:			304,000	92,000	396,000
Rehab Extra	brTCP	Traffic Control/Protection	1-5	0	130,000	39,000	169,000
Rehab Extra	brTCP	Traffic Control/Protection	6-10	0	7,000	2,000	9,000
		Rehab Extra Subtotal:			137,000	41,000	178,000

I. ENGINEERING RECOMMENDATIONS

Bridge Drawings:
Estimated Posting: t
Evaluated Posting: t t t
Closure Date:
Closure Type:
Monitoring Interval:
Monitoring Component:

J. DESIGN PARAMETERS

Design Class:
Operational Status: -
Abutment Type:
Design Deck Width:
Design Deck Length:

K. IMPROVEMENT COSTS

Total Construction/Rehab	574,000
Total Inspection	0
TOTAL	574,000
88606 share @100%	574,000

INSPECTION NOTES

Bridge No.: 1

Bridge No. 1, Monk Street Bridge, Monk Street, 0.20 km North of Pine Street, Township of Chapleau:

- Structure is not posted with a load limit.
- Five span (15.2m+/-; 25.9m+/-; 25.0m+/-; 15.2m+/-) precast concrete girder bridge with a concrete deck and asphalt wearing surface.
- The barrier walls are in generally good condition with narrow cracks, localized delaminations, localized light spalling, rust stains, and peeling of the coating on the interior fascia (4.0m², poor).
- Steel parapet rails are in generally good condition with travelling of the rails, localized minor collision damage and four missing end caps.
- Concrete curbs are in generally good condition with minor abrasions along the edges, transverse cracks, narrow cracks, a localized minor delamination and spalls (0.5m², poor). Three broken junction box cover plates noted.
- Asphalt wearing surface is in good condition.
- Deck drainage is accommodated by 4 - 150mm diameter steel drains which are in good condition.
- The deck expansion joints consist of strip seals set in steel armoring angles and concrete end dams. The concrete end dams are in generally poor to fair condition with severe scaling and spalls (3.0m², poor). The steel armoring angles are in generally good condition with light scaling and minor abrasions. The East joint gap was 65mm and the West joint gap was 52mm. The seals are in poor condition with separation of the seals from the armoring angles along the majority of the length, twisting and deformation of both seals, and both seals have dropped greater than 80mm at about the midspan. Both seals are leaking.
- Concrete deck soffit is in generally good condition with narrow stained transverse cracks on the exterior and interior portions.
- Precast concrete girders are in generally good condition with two localized spalls (0.5m², poor) along the middle portion of the girders and delaminations and spalls at the ends of the girders (2.0m², poor).
- The concrete end diaphragms are in generally poor to good condition with debonding/spalling of the patches (West side more severe) (4.0m², poor).
- The elastomeric bearing pads at the abutments are in generally fair to good condition with movement and rotation of the pads noted at all locations. Localized damage and narrow cracking of the pads noted. The two exterior pads at the East abutment have shifted partially off the bearing seat.
- The concrete abutments are in generally fair to good condition with narrow to medium vertical cracks, light delaminations, wet areas, and surface rust stains of the front faces (1.0m², poor). Severe spalling of the bearing seat was noted in the northwest corner (0.5m², poor). The ballast walls are in poor to fair condition with spalling and exposed corroded rebar (2.0m² East, 10.0m², West). Spalling at the West abutments is extensive and very severe.
- Concrete piers are in generally good condition with narrow cracks. The West face of the east pier and the East face of the West pier were rehabilitated in 2009 to a height of approximately 1.5m above grade. The East waterproofing repair has been damaged by sand removal equipment.
- Concrete slope paving is in generally good condition with minor undermining and severe scaling at the top of the wall.
- Concrete approach slabs are in generally good condition with minor settlement.
- Asphalt paved approach roads are in good condition.
- Concrete curb and gutter on the approach roads is in good condition.
- Steel beam guiderail on the approaches is in generally good condition with minor collision damage. The guiderail extends around the ramps to the structure.
- Concrete retaining wall in the Southwest quadrant is in generally good condition with narrow to medium random cracks, medium width vertical cracks and a small spall at one expansion joint. Minor rotation of the wall was noted in one panel. There is visual evidence that the concrete contains alkali reactive aggregate.
- No serious evidence of structural distress.
- Structure does not require posting with a load limit.
- Not costed for sidewalk on structure as pedestrian traffic is accommodated on another structure to the South of the highway structure.
- Should replace bearing pads at the abutments, repair or replace expansion joints or install semi-integral joint system, patch barrier walls, girders, repair debonded patches at diaphragms.
- Should clean catch basins, deck drains, reposition parapet rails, replace junction box covers and replace missing end caps as part of normal structure maintenance.
- Short term repairs would include restraining bearings, replacement of expansion joint seals and provision of continous cover plates (not costed).
- Estimated remaining service life is 50 years. The remaining service life of the bridge will be reduced if the structure is not maintained.

L. HISTORY/ GENERAL

Bridge No.: 1

Year: 2006, DCS Deck Condition Survey, Est Cost: 0

Year: 2007, PWP Patch, Waterproof, Pave, Est Cost: 0

Year: 2007, IAG Install Approach Guiderail, Est Cost: 0

Year: 2007, RCSC Rehabilitation/Replacement of safety curbs, Est Cost: 0

Year: 2007, TJS Transverse Exp Joint Seal Replacement, Est Cost: 0

Year: 2007, RIR Railing Improvement/Replacement, Est Cost: 0

Comments: LOOKING WEST OVER STRUCTURE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 094.JPG

Comments: SOUTH ELEVATION
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 119.JPG

Comments: TYPICAL PIER
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 075.JPG

Comments: TYPICAL SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 076.JPG

Comments: NARROW STAINED CRACK ON DECK SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 081.JPG

Comments: EAST ABUTMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 084.JPG

Comments: DEBONDED PATCH ON EAST ABUTMENT DIAPHRAGM
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 086.JPG

Comments: GOUGE OUT OF ABUTMENT BEARING PAD
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 087.JPG

Comments: SEVERE SCALING OF SLOPE PROTECTION
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 088.JPG

Comments: MOVEMENT OF BEARING PAD
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 089.JPG

Comments: DELAMINATION AT GIRDER END
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 091.JPG

Comments: NORTH ELEVATION
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 092.JPG

Comments: DELAMINATION ON BARRIER WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 093.JPG

Comments: EAST EXPANSION JOINT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 096.JPG

Comments: SEVERE SPALLING OF EAST JOINT END DAM
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 097.JPG

Comments: TWISTING OF EAST JOINT SEAL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 098.JPG

Comments: MISSING SECTION OF ARMORING ANGLE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 099.JPG

Comments: COLLISION DAMAGE TO HANDRAIL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 103.JPG

Comments: WEST EXPANSION JOINT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 105.JPG

Comments: DEFORMATION OF WEST JOINT SEAL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 106.JPG

Comments: SPALLING OF ABUTMENT SEAT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 108.JPG

Comments: DEBONDED PATCH AT WEST ABUTMENT DIAPHRAGM
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 110.JPG

Comments: SPALLING OF WEST ABUTMENT DIAPHRAGM
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 111.JPG

Comments: DELAMINATION ON ABUTMENT WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 112.JPG

Comments: SEVERE SPALLING OF BALLAST WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 114.JPG

Comments: SEVERE EROSION OF EMBANKMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 115.JPG

Comments: SOUTH ELEVATION
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 116.JPG

Comments:
Path:

MUNICIPAL BRIDGE APPRAISAL

A. IDENTIFICATION

Bridge Name: LISGAR STREET BRIDGE
Bridge No.: 2
Road Name: LISGAR STREET
Road Section No.
Location: 0.30 km N of MONK STREET
MTO Site No.:
Roadside Env.: R
Posting Sign: t t t
Crossing Type: O-WAT, Over Water
BL Posting: t t t
Low Clear Sign: Narrow Structure Sign:
Federal Navigable Waterway: Yes
Bylaw No.:
Easting: 17 319731
Bridge Value: $ 1,403,000
Bylaw Exp. Date:
Northing: 5301932
Old ID:

B. RAILWAY OVERPASS/UNDERPASS

Railway Level Crossing Number:
Original Board Order Number:
Railway Company:
Date:
Railway Subdivision:
Current Board Order Number:
Subdivision Mileage:
Date:
Transport Canada Crossing No.:
Seniority:
Number of Tracks:

C. JURISDICTION

Owner: 88606
Special Designation:
Local / Area Municipality (Upper Tier Only)
Owner Share: 100.00 %
Designation 2
Geo Area Select Area
☐ Shared?
Adjacent Bridge No.:
Insp Area Select Area
Shared With:
Patrol: Select Area
Heritage Status: R

D. EXISTING CONDITIONS

Substructure Yr: 1983
Span Length: 24.7 m
Longitudinal Joints: 0
Superstructure Yr: 1983
Deck Type: CC - Concrete, Cast in Place
Transverse Joints: 2
Bridge Type: P - IB - S
Deck Length: 25.3 m
Number of Bearings: 12
Crossing Skew: 20 °
Deck Width: 11.8 m
Soil Condition: U
Number of Spans: 1
Deck Area: 298.5 m^2
Abutment and Foundation Type: Open - UN

ROAD OVER BRIDGE

Existing Road Class: L/R
No. of Lanes: 2.0
Barrier Walls/Railings: CP
Operational Status: 2W - OAT
Median Type/Width: m
Min Vertical Clearance: m
Wearing Surface: A
Safety Curb/ (A) N E 1.5 m
Travel Deck Width: 9.10 m
Sidewalk and Curb (B) N / W 0.6 m

ROAD UNDER BRIDGE

Existing Road Class:
No. of Lanes:
Traffic Barrier:
Operational Status: -
Median Type/Width: m
Min Vertical Clearance: m
Opening Under: m
Safety Curb/ (A) m
Surface Width: m
Sidewalk and Curb (B) / m

E. TRAFFIC DATA

Legal Speed Limit: 50

Route Designations

☐ Bus ☐ Truck Route
☐ School ☐ Bike Route

Source:
Bridge 2 Asset Master

	Traffic Count	10 Year Traffic Forecast
Year:	0	10
AADT:		
DHV Factor:	%	%
DHV:	vph	vph
Trucks:	%	%
Peak Directional Split:	%	
10 Year Growth Factor:		
Capacity:		0 vph
20 Year AADT:		0

F. INSPECTIONS

Date: 9/17/2013
Inspected By: Landon Plazek
Approved By: D. Baxter, P.Eng.

Municipality: Township of Chapleau
Bridge No.: 2

G. BRIDGE NEEDS

Field	MCR	PCR	TON	Comments
Superstructure	4	6	1-5	
Wearing Surface	5	6	6-10	
Deck Condition	6	6	ADEQ	
Expansion Joints	4	4	1-5	
Railings	5	6	6-10	
Substructure	5	6	6-10	
Coating	0	0	ADEQ	
Streams/Waterways	6	6	ADEQ	
Curb/Sidewalk	5	6	6-10	

H. FUNCTIONAL NEEDS

Field	Existing	Min Tolerable	Time of Need	Comments
Road Over Bridge				
RO-Trav. Deck Width	9.1	6	ADEQ	Proj Class: 100, 0 (10 YR, 0*1)
RO-LOS	A	E	ADEQ	
RO-Min. Vertical Clear.		4.5	ADEQ	No value for: Min Vertical Clearance
RO-Sidewalks	Y	N	ADEQ	

Recommended Needs

Impr.Class	Improvement	Description	Time of Need	Year	Base/ Const Cost	Eng/Cont	Total
Maintenance	OTHm	Maintenance Improvement	1-5	0	0	0	0
			Maintenance Subtotal:		0	0	0
Rehab	IAG	Install Approach Guiderail	1-5	0	26,000	8,000	34,000
Rehab	RSP	Rehabilitate Superstructure	1-5	0	13,000	4,000	17,000
Rehab	TJM	Transverse Exp Joint Modification	1-5	0	13,000	4,000	17,000
			Rehab Subtotal:		52,000	16,000	68,000
Rehab Extra	brTCP	Traffic Control/Protection	1-5	0	7,000	2,000	9,000
			Rehab Extra Subtotal:		7,000	2,000	9,000

I. ENGINEERING RECOMMENDATIONS

Bridge Drawings:
Estimated Posting: t
Evaluated Posting: t t t
Closure Date:
Closure Type:
Monitoring Interval:
Monitoring Component:

J. DESIGN PARAMETERS

Design Class:
Operational Status: -
Abutment Type:
Design Deck Width:
Design Deck Length:

K. IMPROVEMENT COSTS

Total Construction/Rehab	77,000
Total Inspection	0
TOTAL	77,000
88606 share @100%	77,000

INSPECTION NOTES

Bridge No.: 2

Bridge No. 2, Lisgar Street Bridge, Lisgar Street, 0.30 km North of Monk Street, Township of Chapleau:

- Structure is not posted with a load limit.
- 24.7m+/- single span precast concrete girder bridge with a concrete deck and a asphalt wearing surface.
- Concrete parapet walls are in generally good condition with minor abrasions and localized narrow vertical cracks. Steel parapet rails are in good condition.
- West concrete curb and east concrete sidewalk are in generally good condition with localized narrow transverse cracks. The east sidewalk also exhibits localized narrow longitudinal cracks. Curb faces exhibit minor abrasions. Spalling at joints noted (0.5m², poor).
- Asphalt wearing surface is in generally good condition with narrow random cracks.
- Deck drainage is accommodated by 4 - 150mm diameter steel drains which are in generally good condition with partial plugging with debris.
- Deck expansion joints consist of silicone seals set in steel armouring angles and concrete end dams. Concrete end dams are in poor condition with severe scaling and spalling. The armouring angles are in generally good condition with light corrosion and minor scrape damage. The armouring at the curbs has collision damage. Seals are in generally good condition with deformation of the seals resulting in separation between the seals and armoring. Localized leaking of joints noted. North joint width 56mm, South joint width 24 - 40mm (measured from East end to West end).
- Deck soffit is covered with stay-in-place steel formwork and is in good condition with one small area of corrosion caused by a short deck drain outlet pipe.
- Precast concrete girders are in fair to good condition with spalling with exposed corroded rebar and delaminations at the girder ends (2.0m², poor).
- Elastomeric bearing pads are in good condition.
- End concrete diaphragms are in generally good condition with rust stains, spalls and delaminations (1.0m², poor).
- Styrofoam was noted between the abutment ballast walls, concrete diaphragms and end of the girders.
- Intermediate concrete diaphragms are in generally good condition with a localized delamination (0.25m², poor).
- Concrete abutments are in generally good condition with localized narrow to medium vertical cracks and water staining. Light scaling was noted in some areas. Minor delamination was noted on the south abutment face (0.25m², poor).
- Concrete ballast walls are in generally good condition with efflorescence deposits, narrow stained cracks.
- Concrete wingwalls are in generally good condition with light scaling in the Northeast corner, narrow stained cracks and wet areas.
- Watercourse is unobstructed with no evidence of scour.
- Rock protection on the approaches is in good condition with minor displacement of some stone.
- Asphalt paved approach roads are in generally fair to good condition with narrow cracking.
- Concrete approach slabs are in generally good condition with moderate settling in the Southeast corner.
- Concrete curb and gutter on the approaches are in good condition. The guiderail is end buried in the Northwest, Southeast and Southwest corners with terminal end treatment in the Northeast corner. Steel beam guiderail is extended with steel cable guiderail in the Northeast, Northwest and Southeast quadrants. The timber guiderail posts exhibit medium rot on top.
- No serious evidence of structural distress.
- Structure does not require posting with a load limit.
- Should upgrade guiderail end treatments.
- Should re-attach deck drain in Southeast corner, clean out catch basins and deck drains as part of regular structure maintenance.
- Should repair ends of girders, end diaphragms and expansion joint end dams.
- Estimated remaining service life is 50 years. The remaining service life of the bridge will be reduced if the structure is not maintained.

L. HISTORY/ GENERAL

Bridge No.: 2

Year: 2010, WSR Wearing Surface Rehabilitation, Est Cost: 0

Year: 2010, TJS Transverse Exp Joint Seal Replacement, Est Cost: 0

Comments: LOOKING SOUTH OVER STRUCTURE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 051.JPG

Comments: WEST ELEVATION
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 050.JPG

Comments: SOUTH ABUTMENT WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 073.JPG

Comments: NARROW STAINED CRACK ON EXTERIOR SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 074.JPG

Comments: NORTH EXPANSION JOINT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 052.JPG

Comments: SPALL ON CURB
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 053.JPG

Comments: GAP BETWEEN APPROACH SURFACE AND JOINT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 055.JPG

Comments: SEPARATION OF JOINT SEAL FROM ARMORING ANGLE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 056.JPG

Comments: PARTIALLY PLUGGED DECK DRAIN
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 057.JPG

Comments: SOUTH EXPANSION JOINT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 058.JPG

Comments: SEVERE SPALLING OF SOUTH JOINT END DAM
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 059.JPG

Comments: EFFLORESCENCE ON BALLAST WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 062.JPG

Comments: EFFLORESCENCE ON WINGWALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 063.JPG

Comments: DELAMINATION ON DIAPHRAGM AT ABUTMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 064.JPG

Comments: SPALL AND DELAMINATION ON GIRDER END
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 065.JPG

Comments: NORTH ABUTMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 068.JPG

Comments: TYPICAL ABUTMENT BEARING
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 070.JPG

Comments: DELAMINATION ON ABUTMENT WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 071.JPG

Comments: TYPICAL SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 072.JPG

Comments:
Path:

A. IDENTIFICATION

Bridge Name:	CEDAR STREET BRIDGE			Bridge No.:	3
Road Name:	CEDAR STREET			Road Section No.	
Location:	0.01 km E of GREY STREET			MTO Site No.:	
Roadside Env.:	R	Posting Sign:	3.00 t t t	Crossing Type:	O-WAT, Over Water
BL Posting:	3.00 t t t	Low Clear Sign:	Narrow Structure Sign:	Federal Navigable Waterway:	Yes
Bylaw No.:		Easting:	17 320733	Bridge Value:	$ 861,000
Bylaw Exp. Date:		Northing:	5301552	Old ID:	

B. RAILWAY OVERPASS/UNDERPASS

Railway Level Crossing Number:		Original Board Order Number:	
Railway Company:		Date:	
Railway Subdivision:		Current Board Order Number:	
Subdivision Mileage:		Date:	
Transport Canada Crossing No.:		Seniority:	
Number of Tracks:			

C. JURISDICTION

Owner:	88606	Special Designation:		**Local / Area Municipality (Upper Tier Only)**	
Owner Share:	100.00 %	Designation 2		Geo Area	Select Area
☐ Shared?		Adjacent Bridge No.:		Insp Area	Select Area
Shared With:				Patrol:	Select Area
Heritage Status:	R				

D. EXISTING CONDITIONS

Substructure Yr:	1970	Span Length:	8.9 m	Longitudinal Joints:	0
Superstructure Yr:	1990	Deck Type:	TL - Transverse Lam. Timber	Transverse Joints:	0
Bridge Type:	T - IB - S	Deck Length:	40.5 m	Number of Bearings:	10
Crossing Skew:	0 °	Deck Width:	5.8 m	Soil Condition:	U
Number of Spans:	7	Deck Area:	234.9 m^2	Abutment and Foundation Type:	Open - PC

ROAD OVER BRIDGE

Existing Road Class:	L/R	No. of Lanes:	1.0	Barrier Walls/Railings:	TP
Operational Status:	2W - OAT	Median Type/Width:	m	Min Vertical Clearance:	m
Wearing Surface:	T	Safety Curb/	(A) N N 1.2 m		
Travel Deck Width:	3.00 m	Sidewalk and Curb	(B) N / S 1.2 m		

ROAD UNDER BRIDGE

Existing Road Class:		No. of Lanes:		Traffic Barrier:	
Operational Status:	-	Median Type/Width:	m	Min Vertical Clearance:	m
Opening Under:	m	Safety Curb/	(A) m		
Surface Width:	m	Sidewalk and Curb	(B) / m		

E. TRAFFIC DATA

Legal Speed Limit: 50

Route Designations

☐ Bus ☐ Truck Route
☒ School ☐ Bike Route

Source:
Bridge 3 Asset Master

	Traffic Count	10 Year Traffic Forecast
Year:	0	10
AADT:		
DHV Factor:	%	%
DHV:	vph	vph
Trucks:	%	%
Peak Directional Split:	%	
10 Year Growth Factor:		
Capacity:		0 vph
20 Year AADT:		0

F. INSPECTIONS

Date: 9/17/2013 Inspected By: Landon Plazek Approved By: D. Baxter, P.Eng.

Municipality: Township of Chapleau Bridge No.: 3

G. BRIDGE NEEDS

Field	MCR	PCR	TON	Comments
Superstructure	5	6	6-10	
Wearing Surface	6	6	ADEQ	
Deck Condition	6	6	ADEQ	
Expansion Joints	0	0	ADEQ	
Railings	5	6	6-10	
Substructure	1	1	NOW	
Coating	0	0	ADEQ	
Streams/Waterways	5	6	6-10	
Curb/Sidewalk	6	6	ADEQ	

H. FUNCTIONAL NEEDS

Field	Existing	Min Tolerable	Time of Need	Comments
Road Over Bridge				
RO-Trav. Deck Width	3	6	NOW	
RO-LOS	A	E	ADEQ	
RO-Min. Vertical Clear.		4.5	ADEQ	No value for: Min Vertical Clearance
RO-Sidewalks	Y	N	ADEQ	

Recommended Needs

Impr.Class	Improvement	Description	Time of Need	Year	Base/ Const Cost	Eng/Cont	Total
Maintenance	OTHm	Maintenance Improvement	1-5	0	0	0	0
		Maintenance Subtotal:			0	0	0
Rehab	RSB	Rehabilitate Substructure	NOW	0	215,000	65,000	280,000
		Rehab Subtotal:			215,000	65,000	280,000
Rehab Extra	brTCP	Traffic Control/Protection	NOW	0	7,000	2,000	9,000
		Rehab Extra Subtotal:			7,000	2,000	9,000

I. ENGINEERING RECOMMENDATIONS

Bridge Drawings:
Estimated Posting: t
Evaluated Posting: t t t
Closure Date:
Closure Type:
Monitoring Interval:
Monitoring Component:

J. DESIGN PARAMETERS

Design Class:
Operational Status: -
Abutment Type:
Design Deck Width:
Design Deck Length:

K. IMPROVEMENT COSTS

Total Construction/Rehab	289,000
Total Inspection	0
TOTAL	289,000
88606 share @100%	289,000

INSPECTION NOTES

Bridge No.: 3

Bridge No. 3, Cedar Street Bridge, Cedar Street, 0.01 km East of Grey Street, Township of Chapleau:

- Structure is posted with a 3 tonne load limit.
- Seven span (4.4m+/-; 4.6m+/-; 4.5m+/-; 4.5m+/-; 8.9m+/-; 8.5m+/-; 4.6m+/-) sawn timber girder bridge with a laminated timber deck and timber wearing surface.
- Timber railing is in generally good condition with light checking. Timber handrailing is in good condition. A small tree is growing through the timber handrail.
- Timber curbs are in generally good condition with light checking and loose curb fasteners.
- Timber wearing surface is in good condition with build-up of debris along the sides.
- Laminated timber deck and sidewalks are in good condition.
- Sawn timber girders are in generally good condition with light checking.
- Timber crib abutments are in generally good condition. The west abutment has a pile bent cap beam in front of the abutment.
- Timber piles at the pier trestles and in front of the west abutment are in poor to generally good condition with fire damage and centre rot (30 piles, 22 piles showing severe deterioration). Deterioration does not appear to have worsened significantly although water level is much higher this period. Multiple timber piles have extensive centre rot. Refer to timber inspection report regarding condition of timber piles. Several piles have been replaced and/or new piles driven alongside. Timber cross bracing and pile caps have been replaced. Missing nuts and washers on various cross bracing. The north pier exhibits severe decay of the bottom of the south face.
- Watercourse is unobstructed with no evidence of scour.
- Gravel approach roads are in fair condition with missing granular material at the East and West approaches.
- One section of the steel beam guiderail has been provided in all four quadrants of the structure. No end treatments have been provided.
- Embankments are in generally good condition with minor undermining at the front of the east abutment and the west side of the east pier.
- Retaining walls are in good condition.
- There is evidence of structural distress in the 1st and 2nd timber pile from the south within the 2nd pier trestle from the west.
- Should maintain existing 3 tonne load limit posting.
- Should replace (or splice) decayed timber piles (refer to timber inspection report), repair decayed crib timber members in the 1st pier from the east.
- Missing nuts and washers on all timber pile cross bracing connections, stabilize the embankment with rock protection at the front of the north abutment, grade approaches and remove vegetation from under bridge as part of regular structure maintenance.
- Estimated remaining service life is 27 years. The remaining service life of the bridge will be reduced if the structure is not maintained.

L. HISTORY/ GENERAL

Bridge No.: 3

Year: 2009, C/S Condition Survey of Other Components, Est Cost: 0

Comments: LOOKING EAST OVER STRUCTURE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 001.JPG

Comments: NORTH ELEVATION
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 006.JPG

Comments: TYPICAL SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 017.JPG

Comments: SEVERE SPLITTING OF ABUTMENT PILE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 018.JPG

Comments: VEGETATION GROWTH THROUGH RAILING
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 019.JPG

Comments: MISSING GRANULAR MATERIAL AT WEST APPROACH
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 002.JPG

Comments: TYPICAL DECK TOP WITH DEBRIS
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 003.JPG

Comments: TYPICAL WEARING SURFACE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 004.JPG

Comments: MISSING GRANULAR MATERIAL AT EAST APPROACH
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 005.JPG

Comments: TYPICAL PIER WITH SHEETING
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 007.JPG

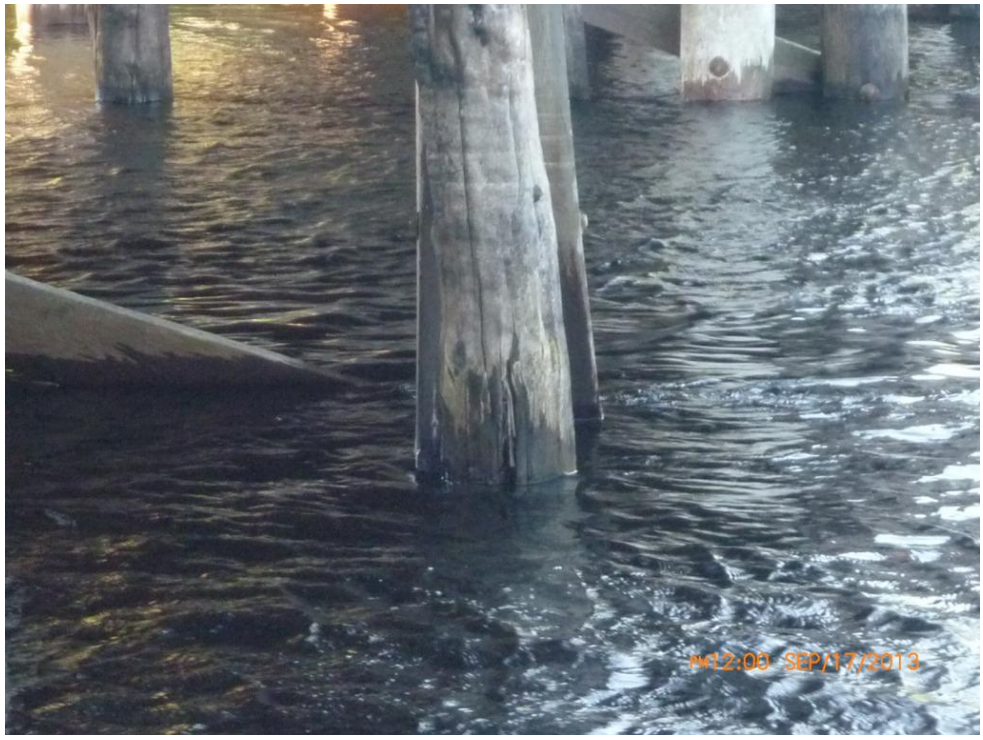
Comments: EAST ABUTMENT WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 008.JPG

Comments: UNDERMINING OF EAST ABUTMENT WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 009.JPG

Comments: FIRE DAMAGE ON EAST PIER SHEETING
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 010.JPG

Comments: TYPICAL PIER WITH SHEETING
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 011.JPG

Comments: SEVERE SPLIT AND FIRE DAMAGE TO PIER PILE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 012.JPG



Comments: SEVERE CENTER ROT OF PIER PILE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 013.JPG

Comments: SEVERE SPLITTING OF WEST ABUTMENT PILE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 014.JPG

Comments: WEST ABUTMENT WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 015.JPG

Comments: SEVERE SPLITTING AND CENTER ROT ON PIER PILE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 016.JPG

Comments:
Path:

A. IDENTIFICATION

Bridge Name:	PEDESTRIAN BRIDGE			Bridge No.:	4
Road Name:	OVER MONK STREET			Road Section No.	
Location:	0.20 km S of MONK STREET BRIDGE			MTO Site No.:	
Roadside Env.:	R	Posting Sign:	t t t	Crossing Type:	O-RD, Over Road
BL Posting:	t t t	Low Clear Sign:	Narrow Structure Sign:	Federal Navigable Waterway:	No
Bylaw No.:		Easting:	17 320053	Bridge Value:	$ 973,000
Bylaw Exp. Date:		Northing:	5301626	Old ID:	

B. RAILWAY OVERPASS/UNDERPASS

Railway Level Crossing Number:		Original Board Order Number:	
Railway Company:		Date:	
Railway Subdivision:		Current Board Order Number:	
Subdivision Mileage:		Date:	
Transport Canada Crossing No.:		Seniority:	
Number of Tracks:			

C. JURISDICTION

Owner:	88606	Special Designation:		**Local / Area Municipality (Upper Tier Only)**	
Owner Share:	100.00 %	Designation 2		Geo Area	Select Area
☐ Shared?		Adjacent Bridge No.:		Insp Area	Select Area
Shared With:				Patrol:	Select Area
Heritage Status:	R				

D. EXISTING CONDITIONS

Substructure Yr:	1980	Span Length:	30.6 m	Longitudinal Joints:	0
Superstructure Yr:	1980	Deck Type:	CC - Concrete, Cast in Place	Transverse Joints:	2
Bridge Type:	P - IB - S	Deck Length:	59.3 m	Number of Bearings:	8
Crossing Skew:	0 °	Deck Width:	3.2 m	Soil Condition:	G
Number of Spans:	2	Deck Area:	189.7 m^2	Abutment and Foundation Type:	Open - UN

ROAD OVER BRIDGE

Existing Road Class:		No. of Lanes:	1.0	Barrier Walls/Railings:	CP
Operational Status:	2W - CVT	Median Type/Width:	m	Min Vertical Clearance:	m
Wearing Surface:	C	Safety Curb/	(A) N N 0.0 m		
Travel Deck Width:	3.20 m	Sidewalk and Curb	(B) N / S 0.0 m		

ROAD UNDER BRIDGE

Existing Road Class:		No. of Lanes:	2	Traffic Barrier:	NO
Operational Status:	2W - OAT	Median Type/Width:	m	Min Vertical Clearance:	m
Opening Under:	m	Safety Curb/	(A) m		
Surface Width:	9.0 m	Sidewalk and Curb	(B) / m		

E. TRAFFIC DATA

Legal Speed Limit:

Route Designations

☐ Bus ☐ Truck Route
☒ School ☒ Bike Route

Source:
Bridge 4 Asset Master

	Traffic Count	10 Year Traffic Forecast
Year:	0	10
AADT:		
DHV Factor:	%	%
DHV:	vph	vph
Trucks:	%	%
Peak Directional Split:	%	Capacity: 0 vph
10 Year Growth Factor:		20 Year AADT: 0

F. INSPECTIONS

Date: 9/16/2013 Inspected By: Landon Plazek Approved By: D. Baxter, P.Eng.

Municipality: Township of Chapleau Bridge No.: 4

G. BRIDGE NEEDS

Field	MCR	PCR	TON	Comments
Superstructure	5	5	6-10	
Wearing Surface	6	6	ADEQ	
Deck Condition	5	6	6-10	
Expansion Joints	5	6	6-10	
Railings	5	5	6-10	
Substructure	5	6	6-10	
Coating	0	0	ADEQ	
Streams/Waterways	0	0	ADEQ	
Curb/Sidewalk	5	6	6-10	

H. FUNCTIONAL NEEDS

Field	Existing	Min Tolerable	Time of Need	Comments
Road Over Bridge				
RO-Trav. Deck Width	3.2	3.2	ADEQ	
RO-LOS	A	E	ADEQ	
RO-Min. Vertical Clear.		4.5	ADEQ	No value for: Min Vertical Clearance
RO-Sidewalks	N	N	ADEQ	

Recommended Needs

Impr.Class	Improvement	Description	Time of Need	Year	Base/ Const Cost	Eng/Cont	Total
Maintenance	OTHm	Maintenance Improvement	1-5	0	0	0	0
			Maintenance Subtotal:		0	0	0
Rehab	BIR	Bearing Improvement/Replacement	1-5	0	52,000	15,000	67,000
Rehab	RSP	Rehabilitate Superstructure	6-10	0	7,000	2,000	9,000
			Rehab Subtotal:		59,000	17,000	76,000

I. ENGINEERING RECOMMENDATIONS

Bridge Drawings:
Estimated Posting: t
Evaluated Posting: t t t
Closure Date:
Closure Type:
Monitoring Interval:
Monitoring Component:

J. DESIGN PARAMETERS

Design Class:
Operational Status: -
Abutment Type:
Design Deck Width:
Design Deck Length:

K. IMPROVEMENT COSTS

Total Construction/Rehab	76,000
Total Inspection	0
TOTAL	76,000
88606 share @100%	76,000

INSPECTION NOTES

Bridge No.: 4

Bridge No. 4, Pedestrian Bridge, Monk Street, 0.20 km North of Monk Street Bridge, Township of Chapleau:

- Structure is not posted with a load limit.
- Two span (28.63m+/-; 30.64m+/- precast concrete girder bridge with a concrete deck.
- Concrete deck is in generally good condition with narrow transverse cracks, light scaling and a build up a debris on the deck surface.
- East concrete approach ramp is in generally good condition with stained transverse cracks on the soffit. 3 localized wide cracks on soffit.
- Span aluminum handrail and posts are in generally good condition. One missing cap on the handrail post of the lower East ramp was noted.
- The four light standards are in good condtion.
- Deck drainage is accommodated by 4 - 100mm diameter galvanized deck drains and are in good condition. Two additional 50mm diameter cored deck drains have been added.
- Expansion joints consist of two compressed rubber seals and are in generally good condition. The East seal is loose at the South end with loss of water sealant noted. Deformation of West joint noted.
- West concrete approach is in generally good condition with the sidewalk leading to the approach slab exhibiting localized narrow cracks.
- Concrete abutment wingwalls are in generally good condition with narrow random and pattern cracking, light scaling and a localized delamination on the East side and at abutments (0.25m², poor). Concrete patch noted.
- Bearing pads at the abutments and piers are in poor condition with severe squashing of the pads in all quadrants. Rotation of pads noted.
- Concrete abutment walls are in good condition with hairline map cracking of the west abutment.
- Concrete end diaphragms are in generally poor condition with spalling (1.0m², poor).
- Concrete deck soffit is in generally good condition with efflorescent stained transverse cracks and staining at the deck/girder joint.
- Precast concrete girders are in generally good condition with diagonal cracking on both sides at the centre pier, narrow transverse cracks and concrete patches.
- Concrete centre pier is in good condition with hairline map cracking.
- Structure does not require posting with a load limit.
- Should recaulk joint at east expansion joint seal to drain pipe as part of regular structure maintenance.
- Should repair diaphragms, replace abutment bearings and monitor girder cracking annually.
- Estimated remaining service life is 50 years. The remaining service life of the bridge will be reduced if the structure is not maintained.

L. HISTORY/ GENERAL

Bridge No.: 4

Year: 2010, RSP Rehabilitate Superstructure, Est Cost: 0
Work Summary: Rehabilitation to east ramp, waterproofed deck and ramp

Comments: LOOKING WEST OVER STRUCTURE
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 031.JPG

Comments: SOUTH ELEVATION
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 027.JPG

Comments: SQUASHING OF EAST ABUTMENT BEARING PAD
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 048.JPG

Comments: DIAGONAL CRACKING ON GIRDER END AT EAST ABUTMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 049.JPG

Comments: NARROW STAINED CRACK ON PEDESTRIAN WALKWAY SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 020.JPG

Comments: WIDE CRACK ON PEDESTRIAN WALKWAY SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 021.JPG

Comments: MISSING HANDRAIL CAP
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 022.JPG

Comments: DIAGONAL CRACK ON ABUTMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 023.JPG

Comments: TYPICAL SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 024.JPG

Comments: TYPICAL PIER
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 025.JPG

Comments: MISSING HANDRAIL BOLTS
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 028.JPG

Comments: SEPARATION OF EAST SEAL FROM GIRDER
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 029.JPG

Comments: EAST EXPANSION JOINT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 030.JPG

Comments: DIAGONAL CRACKING ON GIRDER END AT WEST ABUTMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 032.JPG

Comments: SQUASHING OF WEST ABUTMENT BEARING
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 033.JPG

Comments: NORTH ELEVATION
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 034.JPG

Comments: DIAGONAL CRACKING ON GIRDER END AT WEST ABUTMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 035.JPG

Comments: SPALLING OF ABUTMENT DIAPHRAGM
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 036.JPG

Comments: SQUASHING OF WEST ABUTMENT BEARING
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 037.JPG

Comments: DIAGONAL CRACKING ON GIRDER END AT WEST ABUTMENT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 038.JPG

Comments: WEST ABUTMENT WALL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 039.JPG

Comments: NARROW STAINED CRACK ON DECK SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 040.JPG

Comments: CONCRETE PATCH ON GIRDER
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 041.JPG

Comments: DIAGONAL CRACKING ON GIRDER END AT PIER
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 042.JPG

Comments: TYPICAL SOFFIT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 043.JPG

Comments: WEST EXPANSION JOINT
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 045.JPG

Comments: DEFORMATION OF WEST EXPANSION JOINT SEAL
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 046.JPG

Comments: LOOKING NORTH AT PEDESTRIAN WALKWAY
Path: E:\WorkTech Data\Chapleau\Photos\2013\Photo 047.JPG