2016 Biennial Municipal Bridge & Culvert Inspections

TULLOCH
ENGINEERING

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16-1055
August 3, 2016

Ruth Kelso
Clerk, CAO
1 Johnson Drive
Desbarats, Ontario
P0R 1E0

Dear Mrs. Kelso:

Regarding: Township of Johnson - 2016 Biennial Bridge & Culvert Inspections

Please find enclosed our 2016 Municipal Bridge Inspection Report outlining the results of our field inspections for the above noted project.

The report includes the results of our field inspections and has updated deficiencies and recommendations for eleven (11) structures within the Township's road system. Two culverts on Township's road system were not inspected during this year's biennial bridge/culvert inspections on Township's instruction. The Desbarats River Culvert on Government Road was not inspected as it was replaced in 2014 and the Desbarats River Culvert on Boyer Drive was not inspected as it is believed by the Township to be part of MTO's jurisdiction. The repairs and maintenance items outlined herein should be budgeted and completed as part of your regular maintenance program in order to keep the township's structures safe and in good repair.

We trust the enclosed is adequate for your needs at this time. If there is anything further we can provide please contact us at your convenience.

Sincerely,
Tulloch Engineering Inc.

Matthew Kirby, P. Eng.
Project Manager

MK:mb
Encl. (1)
cc: file

Distribution List

# of Hard Copies	PDF Required	Association / Company Name
1	1	Township of Johnson

Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0	M. Kirby	August 3, 2016	Final Report

Tulloch Signatures

Report Prepared By:

Mack Barber

Report Reviewed By:

Matthew Kirby, P. Eng.
Structural Engineer – Project Manager

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Executive Summary

The Township of Johnson 2016 Biennial Bridge & Culvert Inspection Report provides a summary of the structure condition ratings identified during the structure inspections conducted by Tulloch Engineering in June of 2016. Bridge inventory for the six (6) bridges and five (5) culverts on the township's road system are included in the report. Two (2) culverts on the township's road system were not inspected at the time of our inspections as was instructed by the Township.

Data collection/updating 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 the collected data with discussion and analysis of the structures needs.

A total of eleven (11) structures were re-appraised in 2016. Key items contained within the inspection report are summarized below;

- Three (3) structures require further engineering investigations to determine the condition of non-visible elements or elements which could have internal defects and are accessible. These additional investigations will provide condition information which can be incorporated into evaluating the feasibility of rehabilitation vs. replacement of the structure and the remaining useful life before repairs or replacement are necessary. The estimated cost for the engineering investigations and rehabilitation vs. replacement analyze are **$35,000.**
- A summary of the total structure construction and rehabilitation needs resultant from the 2016 Structure Appraisals for the ten year period are estimated to be **$1,775,000** for the existing Township's structures. Of this total cost **$185,000** are NOW needs and **$780,000** are for structure 1-5 year needs with Sucker Creek Road Culvert (on Government Road near the Dump) requiring replacement or a culvert lining. We have **$800,000** estimated for the 6-10 year needs at this time with anticipation that the Black Creek Bridge and Government Road Culvert (0.4km east of Fisher Road) will require replacement. We have recommended further investigation as mentioned above to provide information regarding the condition of non-visible primary elements. Depending on the findings from further engineering investigations some rehabilitation or replacement costs may be added or pushed further into the 6-10 year forecasted expenditures.
- The existing guiderail systems or lack thereof at some of the structures require upgrades or consideration to increase vehicular safety when approaching and crossing the bridge or culvert structures. Any existing guiderail systems with broken or severely decayed elements need to be changed as part of the townships regular maintenance program along with erosion control and bridge cleaning.
- The average age of the six (6) bridge structures appraised were **58+** years as compared to the average age of the five (5) culvert structures appraised which were **27+** years.

Major and minor rehabilitation 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.

All total project costs contained within the appraisal forms include engineering and contingencies and are based on 2016 construction dollars.

Completion of the 2016 re-inspection of the eleven (11) 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 structures are kept safe and in good repair. The maintenance program will require updating of the databases on an on-going annual basis to reflect previous year rehabilitation/replacement projects and updates. It is recommended that the structures be re-appraised by a qualified structural engineer every two (2) years.

Table of Contents

List of Tables

Appendices

1. Introduction

Amendments have been made to the Highway Traffic Act (Section 123(2)) and the Bridges Act (Section 2). New regulations for municipal structures have also been introduced and came into effect on April 1st, 1997.

The township is responsible for ensuring that their structures are kept safe and in good repair. This has to be done through the performance of regular structure inspections (every 2 years) in accordance with the Ontario Structure Inspection Manual or equivalent.

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.

TULLOCH Engineering (TULLOCH) was retained by the Township of Johnson to inspect six (6) bridge and five (5) culvert structures on the township's road system. The structures have been prioritized and recommendations have been provided for each structure in regards to the maintenance, repair and replacement works for each of the structures.

The procedures and inspections used to carry out these 2016 biennial bridge inspections are explained in detail in the following manuals published by the Ministry of Transportation and Municipal Engineers Association.

1. Municipal Bridge Appraisal Manual, February 1992
2. Municipal Culvert Appraisal Manual, August 1993
3. Ontario Structure Inspection Manual, October 2000 (Revised November 2003 and April 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 eleven (11) structures which are currently identified on the township'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. 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.
4. Relative rankings of bridge needs have also been provided.
5. 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 have been 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.

Note: The structure and road numbers for the bridges and culverts were previously updated to coincide with the structure and road numbers shown in your current Asset Management Plan.

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

A total of eleven (11) of the Township’s structures were re-appraised. The results of our inspection and recommendations are summarized on the Municipal Bridge Appraisal Sheets which have been provided in Appendix A of this report. Based on a review of our inspection findings, recommendations and cost estimates were developed for each of the structures in regards to the required maintenance, repair or replacement as shown in Sections I to K of the appraisal forms. Appendix B of this report summarizes the basic structure data for the structures and the needs identified through the appraisal forms/manuals. The priority ranking of the

structures based on the results of our findings during the inspections are also shown. Of the township's structures that were appraised, the following recommendations are noted:

- Three (3) structures, one (1) bridge and two (2) culverts require further engineering investigations to confirm conditions of non-visible elements or elements with limited accessibility that displayed signs of degrading and further investigation would provide details as to the feasibility between rehabilitation and replacement of the elements/structure. The two (2) culvert structures have been allocated for rehabilitation or replacement within the next 5 years, however these costs may be forecasted into the 6-10 year needs as deemed applicable through the information found through the condition study(s).

TABLE 1 – Township of Johnson
Structure Engineering Investigation Need Summary - 2016

Structure No.	Name & Location	Recommended Engineering Investigation (Proposed Year)	Cost for Budget Purposes ($1000's)
B4	Suddaby Creek Bridge Old Mill Road - 0.2km North of Gordon Lake Road	Deck Condition Survey (2017) Rehab/Replacement Analysis (2017 or 2018)	10 5
C2	Sucker Creek Culvert Government Road – 1.9km West of Lake Huron Drive	Condition Study/Survey (Barrel below water)	10
C3	Sucker Creek (Near CASS) Kensington Point Road – 0.4km South of Highway 17	Condition Study/Survey (Barrel below water)	10

- The Suddaby Creek Bridge which is an old structure (built in 1913) will require some extensive rehabilitation work to maintain and extend the useful life of the existing structure. The structure currently has a 10 tonne load posting and regardless of the rehabilitation to the structure's concrete, without a load evaluation, the structure will require the 10 tonne load limit to remain in effect.

- The majority of the structures do not have any approach guiderails and installing approach guiderails for vehicular safety should be considered in the next 5 years. Any structures with wooden posts or wooden offset blocks should be checked annually and any severely decayed or broken posts should be replaced as part of your regular maintenance program. This item of installing and/or upgrading the approach guiderail/railing systems is identified in the appraisal forms and in the Bridge & Culvert Inventory Table presented in Appendix B.

- No structures require ongoing monitoring to ensure safety and serviceability.

- The structures can continue to operate at their current load postings.

The following abbreviations are used in the Municipal Bridge & Culvert Inventory table in Appendix B:

Crossing Type

O-WAT Over Water
O-RWY - Over Railway

U-RWY - Under Railway
O-R/R - Over Road and Railway
T-RWY- Through Railway Embankment

Engineering Investigations

DCS - Deck Condition Survey
LCE - Load Capacity Evaluation
C/S - Condition Study/Survey
RRA - Rehabilitation / Replacement Analysis

Type of Improvements

i) **Capital Improvements**

REB - Remove Existing Bridge
RBC - Replace Bridge with Culvert
RSL - Replace Bridge, Same Location
NCE - New Culvert

ii) **Bridge/Culvert Rehabilitation Improvements**

RSP - Rehabilitate Superstructure
RSB - Rehabilitate Substructure
WSS - Widen Superstructure and Substructure
RRW - Rehabilitation/Replace Retaining Walls
BIR - Bearing Improvement/Replacement
RIR - Railing Improvement/Replacement
RIO - Rehabilitate Inlet/Outlet Treatments

iii) **Deck Rehabilitation Improvements**

WSR - Wearing Surface Rehabilitation
PWP - Patch, Waterproof and Asphalt Paving
LMC - Latex Modified Concrete Overlay
OPW – Overlay, Waterproof and Asphalt Paving
CDS - Concrete Deck Soffit Repairs
CDR - Complete Deck Replacement
TJS - Transverse Expansion Joint Seal Replacement
TJR - Transverse Expansion Joint Replacement
RCS - Rehabilitation/Replacement of Safety Curbs/Sidewalks

iv) **Bridge Coating Improvements**

CSS - Coating Structural Steel
CSR - Coating Steel Railings

v) **Stream/Waterway Improvements**

EIR - Embankment Improvements/Rehabilitation
C/I - Channel Improvements

vi) **Safety Improvements**

IAG - Installation of Approach Guiderail
RIR - Railing Improvement/Replacement

vii) **Non Standard Improvements**

OTH - Other Improvements

Costing Category
PC - Preliminary Cost Estimate

5. Structure Inventory and Construction Need Summary

Table 2 which follows, provides a summary of the total structure construction and rehabilitation needs resultant from the 2016 Structure Appraisals. For the ten year period, the rehabilitation needs are estimated to be $1,750,000 for the existing township structures. Of this total cost, $170,000 are for structure Now needs, $1,180,000 for the 1-5 Year needs as we anticipate the rehabilitation of Suddaby Creek Bridge and the replacement of three (3) large culvert structures (which could be postponed dependent on the details/findings from the condition studies). $400,000 is proposed to be budgeted for the 6-10 Years as we anticipate the replacement of Black Creek Bridge. Some of the estimated costs for the 1-5 year needs may be forecasted into the 6-10 year range depending on the results of the proposed engineering investigations listed previously in Table 1.

TABLE 2 – Township of Johnson
Structure Construction and Rehabilitation Need Summary – 2016
(Cost in Thousands of Dollars)

Description	Now Needs	1-5 Year Needs	Now + 1-5 Year Needs	6-10 Year Needs	Total Needs
B1- Shewfelt Creek Bridge (at Oikari's)	-	10	10	-	10
B2 – Shewfelt Creek Bridge (at Grasley's	-	65	65	-	65
B3 – Stobie Creek Bridge	-	60	60	-	60
B4 - Suddaby Creek Bridge	25	275	300	-	300
B5 – Suddaby Park Bridge	-	-	-	-	-
B6 – Black Creek Bridge	-	80	80	400	480
Total Bridge Rehabilitation Needs	25	490	515	400	915
C1 – Desbarats River Culvert (on Government Road)	New culvert was not inspected				-
C2 - Sucker Creek Road Culvert (on Government Road)	40	300	340	-	340
C3 – Sucker Creek Culvert (near CASS)	40	-	40	-	40
C4 – Desbarats River Culvert (on Boyer Drive)	New culvert was not inspected				-
C5 – Government Road Culvert	40	-	40	400	440
C6 – Does Not Exist					
S7 – Sucker Creek Culvert (on Puddingstone Road)	-	-	-	-	-
S8 – Sucker Creek Culvert (on MacDonald Drive)	40	-	40	-	40
Total Culvert Rehabilitation Needs	160	300	460	400	860

6. Normal Structure Maintenance

The following normal structure maintenance items have not been costed and were identified as a result of the 2016 re-inspections of the structures. It was presumed that the Township would be able to conduct the listed maintenance items with its own forces. If any of these items cannot be completed with Township forces than these items would be an additional cost for the respective structure listed in Table 2.

TABLE 3 – Township of Johnson
Structure Maintenance Requirement Summary – 2016

Structure No	Location	Maintenance Requirements
B1	Gordon Lake Road – 0.9km North of Hwy. 17	1. Vegetation obstructing the hazard markers should be trimmed or removed. 2. Loose nuts on the base of the guiderail plates on the east side and the loose bolt in the steel arch culvert could be tightened. 3. Settlement of the shouldering behind the gabion baskets in the northwest quadrant should be completed.
B2	Fisher Road – 3.3km North of Hwy. 17	1. Excessive gravel build up on bridge deck and at railings should be removed and the deck drains unplugged. 2. Beaver dam upstream from structure should be removed. 3. Any leaning or bent hazard signs should be straightened.
B3	Government Road – 10m West of Gordon Lake Road	1. Broken or rotated offset blocks on the north railing should be replaced and/or straightened. 2. Cut guiderail in the southwest section should be replaced 3. Minor erosion at the southeast quadrant should be restored and stabilized. 4. Transverse crack in the east approach should be routed and sealed, and pothole on bridge deck should be repaired 5. Remove gravel and vegetation build up on the bridge deck wearing surface and under the guiderails. 6. The gap under the south railing guiderail base plate should have metal shims installed to provide full contact of the baseplate with concrete headwall/curb.
B4	Old Mill Road – 0.2km North of Gordon Lake Road	1. Remove excess gravel/debris built up on bridge deck and curb/railings. 2. Remove small trees that are growing under, immediately adjacent to bridge beams or on the abutment embankments.
B5	Gordon Lake Road – 0.5km North of Suddaby Park Road	1. Monitor transverse cracking in surface treated roadway and rout and seal or patch as required. 2. Replace the missing bolts in the guiderail at all four quadrants to connect flex beam to the posts.

B6	Gordon Lake Road – 80m South of Suddaby Park Road	1. Cracking of and potholes in the surface treated roadway surface should be sealed or patched. 2. Clean deck/railings of excess gravel. 3. Hazard signs should be straightened or replaced 4. Restore and stabilize erosion of roadway embankments at corners of the bridge. 5. Tree in waterway upstream of structure should be removed.
C1	Government Road – 2.0km West of Gordon Lake Road	N/A – New culvert was not inspected
C2	Government Road – 1.9km West of Lake Huron Drive	1. Should seal or patch cracks in surface treatment to prevent further damage to wearing surface at the structure. 2. Depressions on either side of culvert should be patched to provide smooth roadway over structure. 3. Remove beaver dam within the culvert. 4. Erosion on the north embankments and scour under the pipe inlet should be repaired and stabilized/protected
C3	Kensington Point Road – 0.4km South of Hwy. 17	1. Erosion of roadway embankment appears stable, however the lost material should be replaced and stabilized to prevent channelling of surface runoff.
C4	Boyer Drive – 30m South of Hwy. 17	N/A – Culvert is believed to be MTO jurisdiction by Township and was not inspected as per Townships request.
C5	Government Road – 0.4km East of Fisher Road	1. Roadway should be graded to remove washboard in gravel wearing surface. 2. The missing parging at the opened seams should be repaired. 3. The embankment at and/or under the culvert inlet should be sealed to promote water flow through the culvert and not underneath it. 4. Monitor bulging of culvert barrel at centreline of the roadway and contact Tulloch Engineering if cracks develop.
C6	Does Not Exist	
C7	Puddingstone Road – 2.1km North of Government Road	1. Replace broken or decayed guiderail posts. 2. Lost armoring stone at the culvert inlet should be replaced
C8	MacDonald Drive – 0.4km North of Hwy. 17	1. Remove any debris present at the culvert inlet or the fencing immediately downstream or upstream from the culvert outlet as part of regular maintenance.

7. Conclusions

Completion of the 2016 biennial bridge inspections of all bridge structures on the township's road system has resulted in reliable and current data being available for the township to implement a maintenance, rehabilitation and/or replacement program ensuring the township's structures are kept safe and in good repair.

Maintenance of the Bridge 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-appraised by a qualified structural engineer every two (2) years in accordance with legislated requirements.

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

Appendix A

Municipal Bridge Appraisal Forms

MUNICIPAL BRIDGE APPRAISAL

A. IDENTIFICATION

1. Control Code	3-S-TP			6. Bridge No.	01
2. Municipal Name/Code	Township of Johnson			7. Road Section No.	250
3. Bridge Name	Shewfelt Creek Bridge at Oikari's			8. MTO Site No.	38S-189
4. Road Name	Gordon Lake Road				
5. Location	0.90 km North of Highway 17				
9. Roadside Environment	R			16. Crossing Type	O-WAT
10. Posting	t t t	13. Posting Sign:	t t t	17. Federal Navigable Waterway	Unknown
11. Bylaw No.		14. Low Clearance Sign		18. Bridge Value	$500,000
12. Bylaw Expiry Date	y m	15. Narrow Structure Sign		19. Latitude	
				20. Longitude	

B. RAILWAY OVERPASS/UNDERPASS

21. Railway Level Crossing Number		27. Original Board Order Number	Date y m d
22. Railway Company			
23. Railway Subdivision		28. Current Board Order Number	Date y m d
24. Subdivision Mileage			
25. Transport Canada Crossing No.		29. Seniority	
26. Number of Tracks			

C. JURISDICTION

31. Ownership	O	A MUN		38. Local/Area Municipality (Upper Tier Only) A.	
		B	35. Boundary Bridge	N	B.
32. Heritage Status		R			39. Maintenance Area
33. Special Designation		NSD	36. Adjacent Municipality Name/No		40. Municipal Ward
34. Suburban Roads Commission			37. Adjacent Bridge No.		

D. EXISTING CONDITIONS

GENERAL					
41. Year Constructed	A. 2006	45. Span Length	6.2 m	50. Longitudinal Joints	0
	B. 2006	46. Deck Type	OT	51. Transverse Joints	0
42. Bridge Type	S-EA-F	47. Deck Length	6.2 m	52. Number of Bearings	0
43. Crossing Skew	0^{o}	48. Deck Width	10.3 m	53. Soil Condition	U
44. Number of Spans	1	49. Deck Area	64.0 m^2	54. Abutment & Foundation Type	Open - UN

ROAD OVER BRIDGE

		59. No. of Lanes	2	62. Barriers Walls/Railings	FB
55. Existing Road Class	300	60. Median Type/Width		63. Minimum Vertical	
56. Operational Status	2W - OAT	61. Safety Curb/	(A) N	Clearance	
57. Wearing Surface	A	Sidewalk and	(B) N		
58. Travel Deck Width	7.1 m	Curb Barrier			

ROAD UNDER BRIDGE

	68. No. of Lanes		71. Traffic Barrier	
64. Existing Road Class	69. Median Type/Width		72. Minimum Vertical Clearance	
65. Operational Status	70. Safety Curb/	A		
66. Opening Width	Sidewalk and	B		
67. Surface Width	Curb Barrier			

E. TRAFFIC DATA

	TRAFFIC COUNT	10 YEAR TRAFFIC FORECAST
81. Legal Speed Limit	83. Year	90. Year
	84. AADT	91. AADT
82. Route Designations	85. DHV Factor	92. DHV Factor
	86. DHV	93. DHV
Transit ☐ Truck ☐	87. Trucks	94. Trucks
School ☐ Bicycle ☐	88. Peak Directional Split	95. Capacity
	89. 10 Year Growth Factor	96. 20 Year AADT

F. INSPECTIONS & APPROVALS

101. Date:	June 2, 2016	102. Professional Engineer Name	M. Kirby, P. Eng.
Inspected By:	M. Kirby & S. Milne	103. Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL BRIDGE APPRAISAL

G. BRIDGE NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Superstructure	6	6	ADEQ
112.	Wearing Surface	6	6	ADEQ
113.	Deck Condition	6	6	ADEQ
114.	Expansion Joints	0	0	ADEQ
115.	Railings	5	5	1-5 yrs
116.	Substructure	6	6	ADEQ
117.	Coating	6	6	ADEQ
118.	Streams/Waterways	6	6	ADEQ
119.	Curbs/Sidewalks	0	0	ADEQ

H. FUNCTIONAL NEEDS

ROAD OVER		Existing Condition	Minimum Tolerable	TIME OF NEED
121.	Travel Deck Width	7.1m	6.5m	ADEQ
122.	Level of Service	A	E	ADEQ
123.	Min. Vert. Clear.		4.5	ADEQ
124.	Sidewalks	N	N	ADEQ

I. ENGINEERING RECOMMENDATIONS

131.	Bridge Drawings			UNK
132.	Engineering Investigations	Type	Year	Cost ($000)
	A			
	B			
	C			
	D			
133.	Total Cost of Engineering Investigations			
134.	Single Posting			
135.	Evaluated Posting			t t t
Date				
136.	Monitoring			
137.	Closure/Date			

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL
142.	Operational Status	2W-OAT
143.	Abutment Type	RSL-O
144.	Design Deck Width	7.1m
145.	Design Deck Length	6.2m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A	IAG	PC	1	1-5 yrs	10
B					
C					
D					
E					
F					

K. IMPROVEMENT COST

		Cost ($000)
151.	Construction	10
152.	Approaches	0
153.	Detours	0
154.	Traffic Control/Protection	0
155.	Utilities	0
156.	Other	0
157.	Contingencies 10%	1
158.	Total Construction	11
159.	Right of Way	0
160.	Engineering Environmental Assessment (E/A) Study	0
161.	Engineering Design & Supervision	1.5
162.	Total Project cost	12.5
163.	Eligibility for Subsidy	EFS
164.	Non-subsidizable Costs	

		Contributing Agency	Non-Subsid. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Subsidizable Cost	12.5
167.	Municipal Percent of Subsidizable Cost	100%
168.	Municipal Share of Cost	12.5

L. HISTORY

ENGINEERING INVESTIGATIONS		Type	Year
171.			
172.			
173.			
174.			
175.			

CONSTRUCTION IMPROVEMENTS		Type	Year
181.			
182.			
183.			
184.			
185.			

M. Inspection Notes

- **Bridge No. 01, MTO Site No. 385-189, Shewfelt Creek at Oikari's, Gordon Lake Road - 0.90 km North of Hwy. 17, Township of Johnson:**

- Structure is not posted with a load limit.
- Single span (±6.2m) structural plate arch culvert with concrete head walls and retaining walls with approximately 0.5 m of gravel fill and a surface treated roadway.
- Steel flex beam with channel and wood posts has been provided over the structure and are in good condition with the guiderail posts exhibiting medium to wide checks and splits. A few nuts were noted to be loose on guide rail post base plates along the east railing.
- Eccentric loader end treatments and approach guiderails have been provided in the northeast, southeast and southwest quadrants. There is no guiderail present in the northwest quadrant. Hazard markers have been provided in all four quadrants. The northwest hazard marker is partially obstructed by vegetation.
- Surface treated roadway is in good condition.
- Structural plate steel arch culvert is in good condition with the tenth and eleventh corrugations from the northeast corner having localized indentations (four in each), the second vertical seam from the southwest corner has a loose bolt and light staining below the waterline throughout the culvert's length was noted.
- Watercourse is generally un-obstructed with no evidence of scouring.
- Concrete headwalls are in good condition with minor honey combing in both headwalls.
- Gabion basket retaining walls and vegetated/rock protected roadway embankments are in good condition. The gabion basket retaining wall at the northwest quadrant is bulging outwards towards the ditch line/creek. This has created some minor to moderate settlement of the shouldering material behind the gabion baskets.

Recommendations

- Structure does not require posting with a load limit.
- Should install approach guiderail in the northwest quadrant.
- Vegetation obstructing the hazard markers should be trimmed or removed as part of regular maintenance.
- The loose nuts on the guiderail base plates and the loose bolt in steel arch culvert should be tightened.
- Repairs to the settlement of shouldering behind the gabion baskets in the northwest quadrant should be completed.

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	01
3. Bridge Name	Shewfelt Creek at Oikari	8. MTO Site No.	38S-189
4. Road Name	Gordon Lake Road		
5. Location	0.9 km North of Highway 17		

LOOKING NORTH ACROSS STRUCTURE

WEST ELEVATION

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	01
3. Bridge Name	Shewfelt Creek at Oikari	8. MTO Site No.	38S-189
4. Road Name	Gordon Lake Road		
5. Location	0.9 km North of Highway 17		

LOOKING EAST UPSTREAM FROM STRUCTURE

LOOSE NUTS ON BASEPLATE OF EAST GUIDERAIL POST

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	01
3. Bridge Name	Shewfelt Creek at Oikari	8. MTO Site No.	38S-189
4. Road Name	Gordon Lake Road		
5. Location	0.9 km North of Highway 17		

LOOKING WEST THROUGH CULVERT BARREL

LOCALIZED INDENTATIONS IN THE RIBS OF THE CULVERT BARREL

Bridge Photographs			6.	Bridge No.	01
2.	Municipal Name/Code	Township of Johnson	8.	MTO Site No.	38S-189
3.	Bridge Name	Shewfelt Creek at Oikari			
4.	Road Name	Gordon Lake Road			
5.	Location	0.9 km North of Highway 17			

ROTATED GABION BASKET WINGWALL – NORTHWEST WINGWALL

TYPICAL BARREL END TREATMENT

Bridge Photographs			6.	Bridge No.	01
2.	Municipal Name/Code	Township of Johnson	8.	MTO Site No.	38S-189
3.	Bridge Name	Shewfelt Creek at Oikari			
4.	Road Name	Gordon Lake Road			
5.	Location	0.9 km North of Highway 17			

SCRAPE DAMAGE TO EAST GUIDERAIL

MEDIUM TO WIDE SPLITS AND CHECKS IN APPROACH POSTS AND OFFSET BLOCKS

MUNICIPAL BRIDGE APPRAISAL

A. IDENTIFICATION

1. Control Code	3-S-TP			6. Bridge No.	02
2. Municipal Name/Code	Township of Johnson			7. Road Section No.	265
3. Bridge Name	Shewfelt Creek Bridge at Grasley's			8. MTO Site No.	38S-190
4. Road Name	Fisher Road				
5. Location	3.3 km North of Hwy. 17				
9. Roadside Environment	R			16. Crossing Type	O-WAT
10. Posting	t t t	13. Posting Sign:	t t t	17. Federal Navigable Waterway	Unknown
11. Bylaw No.		14. Low Clearance Sign		18. Bridge Value	$350,000
12. Bylaw Expiry Date	y m	15. Narrow Structure Sign		19. Latitude	
				20. Longitude	

B. RAILWAY OVERPASS/UNDERPASS

21. Railway Level Crossing Number		27. Original Board Order Number	Date y m d
22. Railway Company			
23. Railway Subdivision		28. Current Board Order Number	Date y m d
24. Subdivision Mileage			
25. Transport Canada Crossing No.		29. Seniority	
26. Number of Tracks			

C. JURISDICTION

31. Ownership	O	A MUN		38. Local/Area Municipality (Upper Tier Only)	
		B	35. Boundary Bridge N	A.	
32. Heritage Status		R		B.	
33. Special Designation		NSD	36. Adjacent Municipality Name/No	39. Maintenance Area	
34. Suburban Roads Commission			37. Adjacent Bridge No.	40. Municipal Ward	

D. EXISTING CONDITIONS

GENERAL		45. Span Length	6.1 m	50. Longitudinal Joints	0
41. Year Constructed	A. 1950	46. Deck Type	CC - Cast in Place Concrete	51. Transverse Joints	0
	B. 1950	47. Deck Length	7.0 m	52. Number of Bearings	0
42. Bridge Type	C-TB-F	48. Deck Width	5.1 m	53. Soil Condition	U
43. Crossing Skew	0^{o}	49. Deck Area	35.7 m^2	54. Abutment & Foundation Type	Closed - SF
44. Number of Spans	1				

ROAD OVER BRIDGE

		59. No. of Lanes	1	62. Barriers Walls/Railings	CB
55. Existing Road Class	300	60. Median Type/Width		63. Minimum Vertical	
56. Operational Status	2W - OAT	61. Safety Curb/	(A) N	Clearance	
57. Wearing Surface	G	Sidewalk and	(B) N		
58. Travel Deck Width	4.30 m	Curb Barrier			

ROAD UNDER BRIDGE

	68. No. of Lanes		71. Traffic Barrier	
64. Existing Road Class	69. Median Type/Width		72. Minimum Vertical Clearance	
65. Operational Status	70. Safety Curb/	A		
66. Opening Width	Sidewalk and	B		
67. Surface Width	Curb Barrier			

E. TRAFFIC DATA

	TRAFFIC COUNT	10 YEAR TRAFFIC FORECAST
81. Legal Speed Limit	83. Year	90. Year
	84. AADT	91. AADT
82. Route Designations	85. DHV Factor	92. DHV Factor
	86. DHV	93. DHV
Transit ☐ Truck ☐	87. Trucks	94. Trucks
School ☐ Bicycle ☐	88. Peak Directional Split	95. Capacity
	89. 10 Year Growth Factor	96. 20 Year AADT

F. INSPECTIONS & APPROVALS

101. Date:	June 2, 2016	102. Professional Engineer Name	M. Kirby, P. Eng.
Inspected By:	M. Kirby & S. Milne	103. Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL BRIDGE APPRAISAL

G. BRIDGE NEEDS

		RATING		
		MCR	PCR	TIME OF NEED
111.	Superstructure	4	5	1-5 yrs
112.	Wearing Surface	5	5	6-10 yrs
113.	Deck Condition	4	5	1-5 yrs
114.	Expansion Joints	0	0	ADEQ
115.	Railings	4	5	1-5 yrs
116.	Substructure	3	4	1-5 yrs
117.	Coating	0	0	ADEQ
118.	Streams/Waterways	5	5	6-10 yrs
119.	Curbs/Sidewalks	0	0	ADEQ

H. FUNCTIONAL NEEDS

ROAD OVER		Existing Condition	Minimum Tolerable	TIME OF NEED
121.	Travel Deck Width	4.3m	6.5m	NOW
122.	Level of Service	A	E	ADEQ
123.	Min. Vert. Clear.		4.5	ADEQ
124.	Sidewalks	N	N	ADEQ

I. ENGINEERING RECOMMENDATIONS

131.	Bridge Drawings			UNK
132.	Engineering Investigations	Type	Year	Cost ($000)
	A			
	B			
	C			
	D			
133.	Total Cost of Engineering Investigations			
134.	Single Posting			
135.	Evaluated Posting			t t t
Date				
136.	Monitoring			
137.	Closure/Date			

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL
142.	Operational Status	2W-OAT
143.	Abutment Type	RSL-O
144.	Design Deck Width	6.5m
145.	Design Deck Length	7.0m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A	RSB	PC		1-5 yrs	15
B	RSP	PC		1-5 yrs	10
C	IAG	PC	4	1-5 yrs	40
D					
E					
F					

K. IMPROVEMENT COST

		Cost ($000)
151.	Construction	25
152.	Approaches	40
153.	Detours	0
154.	Traffic Control/Protection	0
155.	Utilities	0
156.	Other	0
157.	Contingencies 10%	6
158.	Total Construction	71
159.	Right of Way	0
160.	Engineering Environmental Assessment (E/A) Study	0
161.	Engineering Design & Supervision	10
162.	Total Project cost	81
163.	Eligibility for Subsidy	EFS
164.	Non-subsidizable Costs	

		Contributing Agency	Non-Subsid. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Subsidizable Cost	81
167.	Municipal Percent of Subsidizable Cost	100%
168.	Municipal Share of Cost	81

L. HISTORY

ENGINEERING INVESTIGATIONS		Type	Year
171.			
172.			
173.			
174.			
175.			

CONSTRUCTION IMPROVEMENTS		Type	Year
181.			
182.			
183.			
184.			
185.			

M. Inspection Notes

191. **Bridge No. 02, MTO Site No. 385-190, Shewfelt Creek (at Grasley's), Fisher Road - 3.30 km North of Hwy 17, Township of Johnson:**

- Structure is not posted with a load limit.
- Single span (±6.1m) cast in place concrete T-beam bridge with a concrete deck and gravel wearing surface with cast in place concrete railings.
- Concrete railings on deck are in generally good condition with localized minor collision damage. The height of the railing on the deck does not meet current standards.
- Four (4) hazard signs are present at the structure; the sign in the northeast quadrant is bent.
- Gravel approaches and deck wearing surface are generally in good condition. There is buildup of excess gravel on the deck top and at the concrete railings.
- Four (4) cored holes in concrete deck are present; however the deck drainage holes are covered up by the gravel on the bridge deck.
- Concrete deck soffit is in fair condition with moderate scaling; delamination(s) and localized exposed corroded rebar.
- Concrete girders are in good to fair condition with moderate scaling, narrow stained cracks, delamination(s), localized exposed corroded rebar in the second girder from the east near the south abutment wall and wide cracking at haunches on south end of bridge with cracking in the ballast wall.
- Concrete abutment walls have moderate to wide cracks (horizontal), moderate scaling, narrow to medium map cracking with efflorescent staining and delamination(s) throughout. The north abutment wall has horizontal cracking at the cold joint and at the shear connection. It was noted that the north abutment wall was poured right at the edge of the abutment footing. The south abutment wall has horizontal cracks at the cold joints, the mid span and one at the beam elevation.
- Concrete wingwalls are in fair condition with narrow to medium map cracking with efflorescence staining throughout. The northeast wingwall has wide horizontal cracking and the southwest wingwalls has moderate to wide cracking, stained map cracks, delamination(s) and spalls.
- No approach guiderails have been provided at the structure.
- The south abutment footing erosion protection is functioning satisfactorily.
- Vegetated roadway embankments are very steep but are generally in good condition.
- Beaver dam upstream of structure was observed.

Recommendations

- Structure does not require posting with a load limit.
- The excess gravel build up on the bridge deck should be removed and the deck drain holes should be unplugged as part of regular maintenance.
- Should rehabilitate deck soffit, T-beams, abutments and wingwalls.
- Should install traffic protection on the approaches.
- Remove beaver dam as part of regular cleaning/maintenance.
- Any leaning or bent hazard signs should be straightened.

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	02
3. Bridge Name	Shewfelt Creek Bridge at Grasley's	8. MTO Site No.	38S-190
4. Road Name	Fisher Road		
5. Location	3.3 km North of Hwy. 17		

LOOKING NORTH ACROSS STRUCTURE

WEST ELEVATION

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	02
3. Bridge Name	Shewfelt Creek Bridge at Grasley's	8. MTO Site No.	38S-190
4. Road Name	Fisher Road		
5. Location	3.3 km North of Hwy. 17		

NORTH ABUTMENT WALL – NARROW TO MEDIUM MAP CRACKING, NARROW TO WIDE HORIZONTAL CRACKING AND DELAMINATIONS

SOUTH ABUTMENT WALL – NARROW TO MEDIUM MAP CRACKING, NARROW TO WIDE HORIZONTAL CRACKING AND DELAMINATIONS

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	02
3. Bridge Name	Shewfelt Creek Bridge at Grasley's	8. MTO Site No.	38S-190
4. Road Name	Fisher Road		
5. Location	3.3 km North of Hwy. 17		

DECK SOFFIT GENERAL ARRANGEMENT

EXPOSED CORRODED REBAR IN SOUTHEAST INTERIOR BEAM

Bridge Photographs			6.	Bridge No.	02
2.	Municipal Name/Code	Township of Johnson	8.	MTO Site No.	38S-190
3.	Bridge Name	Shewfelt Creek Bridge at Grasley's			
4.	Road Name	Fisher Road			
5.	Location	3.3 km North of Hwy. 17			

GRAVEL WEARING SURFACE – BUILDUP OF GRAVEL ON BRIDGE DECK AND LIGHT WASHBOARD

SOUTHEAST WINGWALL – NARROW TO MEDIUM MAP CRACKING AND WIDE HORIZONTAL CRACK

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	02
3. Bridge Name	Shewfelt Creek Bridge at Grasley's	8. MTO Site No.	38S-190
4. Road Name	Fisher Road		
5. Location	3.3 km North of Hwy. 17		

NORTH ABUTMENT AND NORTHEAST WINGWALL - LOCALIZED SPALL WITH DELAMINATIONS

BEAVER DAM UPSTREAM FROM BRIDGE

MUNICIPAL BRIDGE APPRAISAL

A. IDENTIFICATION

1. Control Code	3-S-TP			6. Bridge No. 38S-307	03
2. Municipal Name/Code	Township of Johnson			7. Road Section No.	350
3. Bridge Name	Stobie Creek at Mennonite School			8. MTO Site No.	38S-307
4. Road Name	Government Road				
5. Location	10m West of Gordon Lake Road				
9. Roadside Environment	R			16. Crossing Type	O-WAT
10. Posting	t t t	13. Posting Sign:	t t t	17. Federal Navigable Waterway	Unknown
11. Bylaw No.		14. Low Clearance Sign		18. Bridge Value	$450,000
12. Bylaw Expiry Date	y m	15. Narrow Structure Sign		19. Latitude	
				20. Longitude	

B. RAILWAY OVERPASS/UNDERPASS

21. Railway Level Crossing Number		27. Original Board Order Number	Date y m d
22. Railway Company			
23. Railway Subdivision		28. Current Board Order Number	Date y m d
24. Subdivision Mileage			
25. Transport Canada Crossing No.		29. Seniority	
26. Number of Tracks			

C. JURISDICTION

31. Ownership	O	A	MUN	38. Local/Area Municipality (Upper Tier Only)	
		B		A.	
32. Heritage Status		R	35. Boundary Bridge N	B.	
33. Special Designation		CBL	36. Adjacent Municipality Name/No	39. Maintenance Area	
34. Suburban Roads Commission			37. Adjacent Bridge No.	40. Municipal Ward	

D. EXISTING CONDITIONS

GENERAL							
41. Year Constructed	A. 1937	45. Span Length	9.3 m	50. Longitudinal Joints	0
	B. 1937	46. Deck Type	CC – Cast in Place Concrete	51. Transverse Joints	0
42. Bridge Type	C-TB-F	47. Deck Length	10.1 m	52. Number of Bearings	0
43. Crossing Skew	0^{o}	48. Deck Width	5.7 m	53. Soil Condition	U
44. Number of Spans	1	49. Deck Area	57.6 m^2	54. Abutment & Foundation Type	Closed – SF

ROAD OVER BRIDGE

		59. No. of Lanes	1	62. Barriers Walls/Railings	FB
55. Existing Road Class	300	60. Median Type/Width		63. Minimum Vertical	
56. Operational Status	2W - OAT	61. Safety Curb/	(A) N	Clearance	
57. Wearing Surface	A	Sidewalk and	(B) N		
58. Travel Deck Width	4.80 m	Curb Barrier			

ROAD UNDER BRIDGE

	68. No. of Lanes		71. Traffic Barrier	
64. Existing Road Class	69. Median Type/Width		72. Minimum Vertical Clearance	
65. Operational Status	70. Safety Curb/	A		
66. Opening Width	Sidewalk and	B		
67. Surface Width	Curb Barrier			

E. TRAFFIC DATA

	TRAFFIC COUNT	10 YEAR TRAFFIC FORECAST
81. Legal Speed Limit	83. Year	90. Year
	84. AADT	91. AADT
82. Route Designations	85. DHV Factor	92. DHV Factor
	86. DHV	93. DHV
Transit ☐ Truck ☐	87. Trucks	94. Trucks
School ☐ Bicycle ☐	88. Peak Directional Split	95. Capacity
	89. 10 Year Growth Factor	96. 20 Year AADT

F. INSPECTIONS & APPROVALS

101. Date:	June 2, 2016	102. Professional Engineer Name	M. Kirby, P. Eng.
Inspected By:	M. Kirby & S. Milne	103. Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL BRIDGE APPRAISAL

G. BRIDGE NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Superstructure	5	5	6-10 yrs
112.	Wearing Surface	3	4	1-5 yrs
113.	Deck Condition	4	5	1-5 yrs
114.	Expansion Joints	0	0	ADEQ
115.	Railings	3	4	1-5 yrs
116.	Substructure	3	4	1-5 yrs
117.	Coating	0	0	ADEQ
118.	Streams/Waterways	5	5	6-10 yrs
119.	Curbs/Sidewalks	0	0	ADEQ

H. FUNCTIONAL NEEDS

ROAD OVER		Existing Condition	Minimum Tolerable	TIME OF NEED
121.	Travel Deck Width	4.8m	6.5m	NOW
122.	Level of Service	A	E	ADEQ
123.	Min. Vert. Clear.		4.5	ADEQ
124.	Sidewalks	N	N	ADEQ

I. ENGINEERING RECOMMENDATIONS

131. Bridge Drawings — UNK

132. Engineering Investigations

	Type	Year	Cost ($000)
A			
B			
C			
D			

133. Total Cost of Engineering Investigations

134. Single Posting

135. Evaluated Posting — t t t

Date

136. Monitoring

137. Closure/Date

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL
142.	Operational Status	2W-OAT
143.	Abutment Type	RSL-O
144.	Design Deck Width	6.5m
145.	Design Deck Length	10.0m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A	IAG	PC	4	1-5 yrs	30
B	RSB	PC		1-5 yrs	30
C					
D					
E					
F					

K. IMPROVEMENT COST

		Cost ($000)
151.	Construction	30
152.	Approaches	30
153.	Detours	0
154.	Traffic Control/Protection	0
155.	Utilities	0
156.	Other	0
157.	Contingencies 10%	6
158.	Total Construction	66
159.	Right of Way	0
160.	Engineering Environmental Assessment (E/A) Study	0
161.	Engineering Design & Supervision	10
162.	Total Project cost	76
163.	Eligibility for Subsidy	EFS
164.	Non-subsidizable Costs	

	Contributing Agency	Non-Subsid. Cost
A		
B		
C		
D		

165.	Total Non-Subsidizable Cost	
166.	Subsidizable Cost	76
167.	Municipal Percent of Subsidizable Cost	100%
168.	Municipal Share of Cost	76

L. HISTORY

ENGINEERING INVESTIGATIONS	Type	Year	CONSTRUCTION IMPROVEMENTS	Type	Year
171.			181.		
172.			182.		
173.			183.		
174.			184.		
175.			185.		

M. Inspection Notes

- **Bridge No. 03, MTO Site No. 38S-307, Stobie Creek Bridge, Government Road - 10m West of Gordon Lake Road, Township of Johnson:**

- Structure not posted with a load limit.
- Single span (± 9.3m) cast in place concrete T-beam bridge with a concrete deck and an asphalt wearing surface.
- Asphalt wearing surface is in fair condition with a small pothole on deck wearing surface. Asphalt approaches are in fair condition with settlement, depressions and cracking noted at the bridge ends. The east approach has a medium transverse crack. Gravel and vegetation buildup was noted on the bridge deck under the guiderails and the wearing surface.
- Steel flex beam railings on deck are in generally good condition. No offset blocks are present on south railing, new guide rails on steel posts. Offset blocks provided on the north guiderail, however some of the offset blocks are rotated and/or split. The west end of the south guardrail has a large cut (2.0 m long).
- Terminal end treatments have been provided in all four quadrants. A gap was noted under a guiderail post in the south railing and the anchor bolts appear stripped.
- There are hazard markers at each corner of the bridge.
- Concrete deck soffit is in fair to good condition with wide localized cracking in soffit at the interior soffit at the east abutment (0.6m x 0.6m area)
- Concrete T-beams are in fair to good condition with moderate stained cracking on the exterior beam at the northeast corner and minor cracking on the bottom of the east and west ends of the south beam.
- A wide crack from the exterior face of the concrete beam/deck to the curb was noted at the northeast corner. The curb on south side has been repaired and light cracking was noted near the posts.
- Concrete abutment walls are in general good condition with delamination(s).
- Concrete footings are undermined (approximately six inches) with the west footing having severe delamination along the top of footing and the southwest section of the footing having severe spalling and erosion.
- Watercourse is unobstructed with evidence of severe scour and undermining along both abutments.
- No traffic protection is provided on the approaches.
- Vegetated roadway embankments are in good condition with minor erosion (small channelization in the southeast quadrant).

Recommendations

- Structure does not require posting with a load limit.
- The undermining of the abutments should be repaired and stabilized/protected.
- Should replace broken/rotated offset blocks at north guiderail; replace cut section of guiderail in the south railing.
- Rout and seal transverse crack in the east approach and repair pothole on the bridge deck wearing surface.
- The minor erosion noted at the southeast quadrant should be repaired and stabilized as part of the regular maintenance program.
- The gravel and vegetation build up on the bridge deck wearing surface and under the guiderails should be removed as part the regular maintenance program.
- Potholes in deck wearing should be repaired.
- The gap under the south railing guiderail base plate should have some metal shims installed to provide full contact of the baseplate with concrete headwall/curb.
- The moderate to severe undermining of the abutment footings should be repaired and protected from further undermining or scour.
- Traffic protection on the approaches should be considered.

Bridge Photographs				
2.	Municipal Name/Code	Township of Johnson	6. Bridge No.:	03
3.	Bridge Name	Stobie Creek at Mennonite School	7. MTO Site No.	38S-307
4.	Road Name	Government Road		
5.	Location	10m West of Gordon Lake Road		

LOOKING EAST ACROSS STRUCTURE

NORTH ELEVATION

Bridge Photographs			6.	Bridge No.:	03
2.	Municipal Name/Code	Township of Johnson	7.	MTO Site No.	38S-307
3.	Bridge Name	Stobie Creek at Mennonite School			
4.	Road Name	Government Road			
5.	Location	10m West of Gordon Lake Road			

ROTATED AND SPLIT OFFSET BLOCK – NORTH GUARDRAIL

LARGE CUT IN THE SOUTHWEST GUIDERAIL

Bridge Photographs				
2.	Municipal Name/Code	Township of Johnson	6. Bridge No.:	03
3.	Bridge Name	Stobie Creek at Mennonite School	7. MTO Site No.	38S-307
4.	Road Name	Government Road		
5.	Location	10m West of Gordon Lake Road		

MODERATE TO WIDE TRANSVERSE CRACK IN EAST APPROACH

CONCRETE EROSION AND LARGE SPALL IN FOOTING

Bridge Photographs				
2.	Municipal Name/Code	Township of Johnson	6. Bridge No.:	03
3.	Bridge Name	Stobie Creek at Mennonite School	7. MTO Site No.	38S-307
4.	Road Name	Government Road		
5.	Location	10m West of Gordon Lake Road		

BEAM AND DECK SOFFIT GENERAL ARRANGEMENT

LOCALIZED MEDIUM TO WIDE CRACKING OF INTERIOR DECK SOFFIT AT THE EAST ABUTMENT

Bridge Photographs			6.	Bridge No.:	03
2.	Municipal Name/Code	Township of Johnson	7.	MTO Site No.	38S-307
3.	Bridge Name	Stobie Creek at Mennonite School			
4.	Road Name	Government Road			
5.	Location	10m West of Gordon Lake Road			

EAST ABUTMENT WALL AND FOOTING – EROSION OF CONCRETE FOOTING

WEST ABUTMENT WALL AND FOOTING – SEVERE DELAMINATION OF TOP OF FOOTING

Bridge Photographs			6.	Bridge No.:	03
2.	Municipal Name/Code	Township of Johnson	7.	MTO Site No.	38S-307
3.	Bridge Name	Stobie Creek at Mennonite School			
4.	Road Name	Government Road			
5.	Location	10m West of Gordon Lake Road			

LOOKING NORTH, UPSTREAM OF STRUCTURE

MUNICIPAL BRIDGE APPRAISAL

A. IDENTIFICATION

1. Control Code	3-S-TP			6. Bridge No.	04
2. Municipal Name/Code	Township of Johnson			7. Road Section No.	240
3. Bridge Name	Suddaby Creek Bridge			8. MTO Site No.	38S-151
4. Road Name	Old Mill Road				
5. Location	0.20 km North of Gordon Lake Road				
9. Roadside Environment	R			16. Crossing Type	O-WAT
10. Posting	10t t t	13. Posting Sign:	10t t t	17. Federal Navigable Waterway	Unknown
11. Bylaw No.		14. Low Clearance Sign		18. Bridge Value	$750,000
12. Bylaw Expiry Date	y m	15. Narrow Structure Sign		19. Latitude	
				20. Longitude	

B. RAILWAY OVERPASS/UNDERPASS

21. Railway Level Crossing Number		27. Original Board Order Number	Date y m d
22. Railway Company			
23. Railway Subdivision		28. Current Board Order Number	Date y m d
24. Subdivision Mileage			
25. Transport Canada Crossing No.		29. Seniority	
26. Number of Tracks			

C. JURISDICTION

31. Ownership O	A MUN			38. Local/Area Municipality (Upper Tier Only)
	B	35. Boundary Bridge	N	A.
32. Heritage Status	R			B.
33. Special Designation	NSD	36. Adjacent Municipality Name/No		39. Maintenance Area
34. Suburban Roads Commission		37. Adjacent Bridge No.		40. Municipal Ward

D. EXISTING CONDITIONS

GENERAL					
41. Year Constructed	A. 1913	45. Span Length	6.3 m	50. Longitudinal Joints	0
	B. 1913	46. Deck Type	CC – Cast in Place Concrete	51. Transverse Joints	0
42. Bridge Type	C-TB-C	47. Deck Length	21.3 m	52. Number of Bearings	0
43. Crossing Skew	0^{o}	48. Deck Width	5.3 m	53. Soil Condition	U
44. Number of Spans	3	49. Deck Area	112.9 m^2	54. Abutment & Foundation Type	Closed - UN

ROAD OVER BRIDGE

		59. No. of Lanes	1.0	62. Barriers Walls/Railings	LP
55. Existing Road Class	300	60. Median Type/Width		63. Minimum Vertical	
56. Operational Status	2W - OAT	61. Safety Curb/	(A) N / E 0.1 m	Clearance	
57. Wearing Surface	C	Sidewalk and	(B) N / W 0.1 m		
58. Travel Deck Width	4.20 m	Curb Barrier			

ROAD UNDER BRIDGE

	68. No. of Lanes		71. Traffic Barrier	
64. Existing Road Class	69. Median Type/Width		72. Minimum Vertical Clearance	
65. Operational Status	70. Safety Curb/	A		
66. Opening Width	Sidewalk and	B		
67. Surface Width	Curb Barrier			

E. TRAFFIC DATA

	TRAFFIC COUNT	10 YEAR TRAFFIC FORECAST
81. Legal Speed Limit	83. Year	90. Year
	84. AADT	91. AADT
82. Route Designations	85. DHV Factor	92. DHV Factor
	86. DHV	93. DHV
Transit ☐ Truck ☐	87. Trucks	94. Trucks
School ☐ Bicycle ☐	88. Peak Directional Split	95. Capacity
	89. 10 Year Growth Factor	96. 20 Year AADT

F. INSPECTIONS & APPROVALS

101. Date:	June 3, 2016	102. Professional Engineer Name	M. Kirby, P. Eng.
Inspected By:	M. Kirby & S. Milne	103. Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL BRIDGE APPRAISAL

G. BRIDGE NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Superstructure	3	3	1-5 yrs
112.	Wearing Surface	4	4	1-5 yrs
113.	Deck Condition	4	4	1-5 yrs
114.	Expansion Joints	0	0	ADEQ
115.	Railings	2	3	NOW
116.	Substructure	3	4	1-5 yrs
117.	Coating	0	0	ADEQ
118.	Streams/Waterways	3	3	1-5 yrs
119.	Curbs/Sidewalks	4	5	1-5 yrs

H. FUNCTIONAL NEEDS

ROAD OVER		Existing Condition	Minimum Tolerable	TIME OF NEED
121.	Travel Deck Width	4.2m	6.5m	NOW
122.	Level of Service	A	E	ADEQ
123.	Min. Vert. Clear.		4.5	ADEQ
124.	Sidewalks	N	N	ADEQ

I. ENGINEERING RECOMMENDATIONS

131.	Bridge Drawings	UNK

132. Engineering Investigations

	Type	Year	Cost ($000)
A	DCS	2017	10
B	RRA	2017	5
C			
D			

133.	Total Cost of Engineering Investigations	15
134.	Single Posting	
135.	Evaluated Posting	t t t
Date		
136.	Monitoring	
137.	Closure/Date	

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL
142.	Operational Status	2W-OAT
143.	Abutment Type	RSL-O
144.	Design Deck Width	6.5m
145.	Design Deck Length	21.3m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($1000)
A	RIR	PC		NOW	25
B	IAG	PC	4	1-5 yrs	40
C	EIR	PC		1-5 yrs	10
D	RSB/RSP	PC		1-5 yrs	200
E	OWP	PC		1-5 yrs	25
Or.					
F	RSL	PC		1-5 yrs	1,000

K. IMPROVEMENT COST

		Cost ($000)
151.	Construction	260
152.	Approaches	40
153.	Detours	0
154.	Traffic Control/Protection	0
155.	Utilities	0
156.	Other	0
157.	Contingencies 10%	30
158.	Total Construction	330
159.	Right of Way	0
160.	Engineering Environmental Assessment (E/A) Study	0
161.	Engineering Design & Supervision	40
162.	Total Project cost	370
163.	Eligibility for Subsidy	EFS
164.	Non-subsidizable Costs	

	Contributing Agency	Non-Subsid. Cost
A		
B		
C		
D		

165.	Total Non-Subsidizable Cost	
166.	Subsidizable Cost	370
167.	Municipal Percent of Subsidizable Cost	100%
168.	Municipal Share of Cost	370

L. HISTORY

ENGINEERING INVESTIGATIONS	Type	Year	CONSTRUCTION IMPROVEMENTS	Type	Year
171.			181.		
172.			182.		
173.			183.		
174.			184.		
175.			185.		

M. Inspection Notes

- **Bridge No. 04, MTO Site No. 38S-151, Suddaby Creek Bridge, Old Mill Road - 0.20 km North of Gordon Lake Road, Township of Johnson:**

- Structure is posted with a 10 tonne load limit.
- Three span (±6.3m, ±6.3m, ±6.3m) cast in place concrete T-Beam bridge with an exposed concrete deck wearing surface, concrete piers and concrete abutments. The bridge has concrete curbs and railing posts with light pipe handrails and gravel approaches.
- The light pipe handrails on the deck are in poor condition with broken concrete posts and missing sections.
- Hazard markers are located in all four quadrants - some bent/falling.
- Concrete deck curbs are in fair to poor condition with missing sections in the northeast quadrant.
- Concrete deck wearing surface is in fair condition with localized spalls, moderate abrasions and wear. Gravel and debris is built up on bridge deck at curbs.
- Deck drainage is accommodated by 6-150mm diameter drains and are clean (free of debris).
- Vegetated roadway embankments are in good condition. Trimming is required on the abutment embankments to eliminate any tree growth under the bridge.
- The north abutment embankment is in good condition.
- Concrete deck soffit is in generally in fair to poor condition with delamination(s), narrow to wide cracking with efflorescence throughout.
- Concrete T-beams are in fair to poor condition with the following:
  - Narrow to wide stained cracks, exposed corroded rebar, severe spalling of the northwest corner exterior beam and wet areas at the north side of the north beam.
  - Spalling at underside of east exterior beam with severely corroded and exposed rebar.
  - Efflorescence at sides and soffit of both interior and exterior beams;
  - Wide cracking at south end of both exterior beams (horizontal cracking);
  - Minor scaling at haunches at south side of south pier;
  - Narrow cracking and delamination(s) at haunch of second beam from east, on the south end, at the north pier;
  - Severe spall, exposed rebar at north span, exterior beams (with moderate flaking and minor section loss of exposed rebar);
  - Moderate scaling and localized spalls at haunches of north abutment wall.
  - Severe spalling on the haunches in the northeast quadrant
- Concrete abutment walls are in fair condition with medium random cracking and light to medium scaling. Concrete ballast walls are in generally fair to poor condition with narrow to wide stained cracks, spalls, delamination(s) and efflorescence.
- Concrete piers are in fair condition with wide traverse cracking at south and north pier footing. Concrete patches at both pier footings. Medium transverse cracking at the top of all pier columns at north pier. The exterior portions of the piers have spalls, delamination(s) and the concrete is beginning to disintegrate.
- Watercourse is generally un-obstructed; however there is evidence of moderate scour/erosion to the south abutment and severe undermining of the pier footings.

Recommendations

- The 10 tonne load limit shall remain in effect.
- Should install traffic protection on the approaches.
- Should clean bridge deck and curbs of excess gravel and remove any small trees growing at the underside of the bridge as part of your regular maintenance program.
- The erosion noted on the south abutment embankment should be repaired and stabilized to prevent the erosion from continuing under heavy rainfalls/ high stream flows. The undermining of the pier footings should also be repaired as soon as possible.
- The bridge railing requires repairs and should be upgraded to meet the current standards.
- Tree growth and vegetation at abutment embankments should be trimmed back to prevent encroachment on/under the bridge.
- A detailed deck condition survey and rehabilitation/replacement analysis is recommended to confirm the rehabilitation vs. replacement recommendation.
- Subject to findings of deck condition survey, repairs to concrete beams, soffit, piers, abutments and curbs/railings should be completed and the deck should be rehabilitated with a waterproofing membrane and wearing surface. The rehabilitation of all the concrete components will not increase the load capacity.
- If this bridge is intended to be subject to higher loads, a load evaluation should be carried out to confirm the rehabilitation/replacement recommendation and any further repair recommendations.

Bridge Photographs			6.	Bridge No.	04
2.	Municipal Name/Code	Township of Johnson	7.	MTO Site No.	38S-151
3.	Bridge Name	Suddaby Creek Bridge			
4.	Road Name	Old Mill Road			
5.	Location	0.20 km North of Gordon Lake Road			

LOOKING SOUTH ACROSS STRUCTURE

WEST ELEVATION

Bridge Photographs			6.	Bridge No.	04
2.	Municipal Name/Code	Township of Johnson	7.	MTO Site No.	38S-151
3.	Bridge Name	Suddaby Creek Bridge			
4.	Road Name	Old Mill Road			
5.	Location	0.20 km North of Gordon Lake Road			

BRIDGE DECK WEARING SURFACE – LIGHT TO MODERATE SCALING AND ABRASIONS

BROKEN SECTION OF CURB AND MISSING SECTION OF RAILING POST IN THE NORTHWEST CORNER

Bridge Photographs			6.	Bridge No.	04
2.	Municipal Name/Code	Township of Johnson	7.	MTO Site No.	38S-151
3.	Bridge Name	Suddaby Creek Bridge			
4.	Road Name	Old Mill Road			
5.	Location	0.20 km North of Gordon Lake Road			

EXPOSED CORRODED REBAR IN EAST EXTERIOR BEAM'S NORTH SPAN

BROKEN CONCRETE FOOTING WITH MODERATE TO SEVERE UNDERMINING

Bridge Photographs			6.	Bridge No.	04
2.	Municipal Name/Code	Township of Johnson	7.	MTO Site No.	38S-151
3.	Bridge Name	Suddaby Creek Bridge			
4.	Road Name	Old Mill Road			
5.	Location	0.20 km North of Gordon Lake Road			

CONCRETE SPALL AND DISINTEGRATION OF SOUTH PIER

SOUTH ABUTMENT AND DECK SOFFIT
GENERAL ARRANGEMENT

MUNICIPAL BRIDGE APPRAISAL

A. IDENTIFICATION

1. Control Code	3-S-TP			6. Bridge No.	05
2. Municipal Name/Code	Township of Johnson			7. Road Section No.	195
3. Bridge Name	Suddaby Park			8. MTO Site No.	38S-152
4. Road Name	Gordon Lake Road				
5. Location	0.5 km North of Suddaby Park Rd.				
9. Roadside Environment	R			16. Crossing Type	O-WAT
10. Posting	t t t	13. Posting Sign:	t t t	17. Federal Navigable Waterway	Unknown
11. Bylaw No.		14. Low Clearance Sign		18. Bridge Value	$500,000
12. Bylaw Expiry Date	y m	15. Narrow Structure Sign		19. Latitude	
				20. Longitude	

B. RAILWAY OVERPASS/UNDERPASS

21. Railway Level Crossing Number	27. Original Board Order Number
22. Railway Company	
23. Railway Subdivision	28. Current Board Order Number
24. Subdivision Mileage	
25. Transport Canada Crossing No.	29. Seniority
26. Number of Tracks	

C. JURISDICTION

31. Ownership O	A MUN			38. Local/Area Municipality (Upper Tier Only)
	B	35. Boundary Bridge	N	A.
32. Heritage Status	R			B.
33. Special Designation	NSD	36. Adjacent Municipality Name/No		39. Maintenance Area
34. Suburban Roads Commission		37. Adjacent Bridge No.		40. Municipal Ward

D. EXISTING CONDITIONS

GENERAL		45. Span Length	5.3 m	50. Longitudinal Joints	0
41. Year Constructed	A. 2009	46. Deck Type	CC – Cast in Place Concrete	51. Transverse Joints	0
	B. 2009	47. Deck Length	5.3 m	52. Number of Bearings	0
42. Bridge Type	P-BC-F	48. Deck Width	13.0 m	53. Soil Condition	U
43. Crossing Skew	0^o	49. Deck Area	68.9 m^2	54. Abutment & Foundation Type	Closed - PC
44. Number of Spans	1				

ROAD OVER BRIDGE

		59. No. of Lanes	2.0	62. Barriers Walls/Railings	FB
55. Existing Road Class	300	60. Median Type/Width	m	63. Minimum Vertical	
56. Operational Status	2W - OAT	61. Safety Curb/	(A) N / E 0.2 m	Clearance	
57. Wearing Surface	A	Sidewalk and	(B) N / W 0.2 m		
58. Travel Deck Width	7.30 m	Curb Barrier			

ROAD UNDER BRIDGE

	68. No. of Lanes		71. Traffic Barrier	
64. Existing Road Class	69. Median Type/Width		72. Minimum Vertical Clearance	
65. Operational Status	70. Safety Curb/	A		
66. Opening Width	Sidewalk and	B		
67. Surface Width	Curb Barrier			

E. TRAFFIC DATA

	TRAFFIC COUNT	10 YEAR TRAFFIC FORECAST
81. Legal Speed Limit	83. Year	90. Year
	84. AADT	91. AADT
82. Route Designations	85. DHV Factor	92. DHV Factor
	86. DHV	93. DHV
Transit ☐ Truck ☐	87. Trucks	94. Trucks
School ☐ Bicycle ☐	88. Peak Directional Split	95. Capacity
	89. 10 Year Growth Factor	96. 20 Year AADT

F. INSPECTIONS & APPROVALS

101. Date:	June 4, 2016	102. Professional Engineer Name	M. Kirby, P. Eng.
Inspected By:	M. Kirby & S. Milne	103. Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL BRIDGE APPRAISAL

G. BRIDGE NEEDS

		RATING		
		MCR	PCR	TIME OF NEED
111.	Superstructure	6	6	ADEQ
112.	Wearing Surface	5	6	6-10 yrs
113.	Deck Condition	6	6	ADEQ
114.	Expansion Joints	0	0	ADEQ
115.	Railings	6	6	ADEQ
116.	Substructure	6	6	ADEQ
117.	Coating	6	6	ADEQ
118.	Streams/Waterways	6	6	ADEQ
119.	Curbs/Sidewalks	6	6	ADEQ

H. FUNCTIONAL NEEDS

ROAD OVER		Existing Condition	Minimum Tolerable	TIME OF NEED
121.	Travel Deck Width	7.3m	6.5m	ADEQ
122.	Level of Service	A	E	ADEQ
123.	Min. Vert. Clear.		4.5	ADEQ
124.	Sidewalks	N	N	ADEQ

I. ENGINEERING RECOMMENDATIONS

131.	Bridge Drawings			UNK
132.	Engineering Investigations	Type	Year	Cost ($000)
	A			
	B			
	C			
	D			
133.	Total Cost of Engineering Investigations			
134.	Single Posting			
135.	Evaluated Posting			t t t
Date				
136.	Monitoring			
137.	Closure/Date			

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	
142.	Operational Status	
143.	Abutment Type	
144.	Design Deck Width	
145.	Design Deck Length	

146.	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A					
B					
C					
D					
E					
F					

K. IMPROVEMENT COST

		Cost ($000)
151.	Construction	0
152.	Approaches	0
153.	Detours	0
154.	Traffic Control/Protection	0
155.	Utilities	0
156.	Other	0
157.	Contingencies 10%	0
158.	Total Construction	0
159.	Right of Way	0
160.	Engineering Environmental Assessment (E/A) Study	0
161.	Engineering Design & Supervision	0
162.	Total Project cost	0
163.	Eligibility for Subsidy	EFS
164.	Non-subsidizable Costs	

		Contributing Agency	Non-Subsid. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Subsidizable Cost	0
167.	Municipal Percent of Subsidizable Cost	100%
168.	Municipal Share of Cost	0

L. HISTORY

ENGINEERING INVESTIGATIONS	Type	Year	CONSTRUCTION IMPROVEMENTS	Type	Year
171.			181.		
172.			182.		
173.			183.		
174.			184.		
175.			185.		

M. Inspection Notes

191. **Bridge No. 05, MTO Site No. 38S -152, Suddaby Park Bridge, Gordon Lake Road - 0.50 km North of Suddaby Park Road, Township of Johnson:**

- Structure not posted with a load limit.
- Single Span (+/-5.3m) precast concrete box structure with a surface treated roadway.
- Surface treated roadway is in a good condition. Medium transverse cracks in the south approach wearing surface were noted.
- Steel flex beam guiderail on wood posts has been provided over the structure and on the approaches and is in good condition.
- Extruder end treatments have been provided in all four quadrants and are in good condition. Hazard markers have been provided in all four quadrants.
- Rock protected roadway embankments are in good condition
- Concrete retaining walls are in good condition.
- Concrete deck soffit is in good condition. The parging at all of the construction joints between precast sections has separated or is missing along the barrel of the structure.
- Watercourse is generally unobstructed with no evidence of scour.
- No serious evidence of structural distress.
- Structure does not require posting with a load limit.
- Guiderails on the approaches are missing bolts in all four quadrants.

Recommendations

- The cracking of the surface treated roadway surface should be monitored and rout and sealed or patched to prevent extensive damage to the wearing surface.
- Replace the missing bolts in the guiderail at all four quadrants to connect flex beam to the posts.

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	05
3. Bridge Name	Suddaby Park	7. MTO Site No.	38S-152
4. Road Name	Gordon Lake Road		
5. Location	0.5km North of Suddaby Park Rd.		

LOOKING SOUTH ACROSS STRUCTURE

EAST ELEVATION

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	05
3. Bridge Name	Suddaby Park	7. MTO Site No.	38S-152
4. Road Name	Gordon Lake Road		
5. Location	0.5km North of Suddaby Park Rd.		

DECK WEARING SURFACE – FACING NORTH

LOOKING EAST THROUGH BARREL

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	05
3. Bridge Name	Suddaby Park	7. MTO Site No.	38S-152
4. Road Name	Gordon Lake Road		
5. Location	0.5km North of Suddaby Park Rd.		

LOSS OF PARGING IN CULVERT BARREL JOINTS

MEDIUM TRANSVERSE CRACK IN SOUTH APPROACH WEARING SURFACE

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	05
3. Bridge Name	Suddaby Park	7. MTO Site No.	38S-152
4. Road Name	Gordon Lake Road		
5. Location	0.5km North of Suddaby Park Rd.		

GUIDERAIL POST MISSING BOLT

GABION BASKETS ALONG WEST ROADWAY EMBANKMENTS

Bridge Photographs			
2. Municipal Name/Code	Township of Johnson	6. Bridge No.	05
3. Bridge Name	Suddaby Park	7. MTO Site No.	38S-152
4. Road Name	Gordon Lake Road		
5. Location	0.5km North of Suddaby Park Rd.		

LOOKING UPSTREAM OF STRUCTURE

MUNICIPAL BRIDGE APPRAISAL

A. IDENTIFICATION

1. Control Code	3-S-TP			6. Bridge No.	06
2. Municipal Name/Code	Township of Johnson			7. Road Section No.	205
3. Bridge Name	Black Creek Bridge			8. MTO Site No.	38S-153
4. Road Name	Gordon Lake Road				
5. Location	80m South of Suddaby Park Road				
9. Roadside Environment	R			16. Crossing Type	O-WAT
10. Posting	t t t	13. Posting Sign:	t t t	17. Federal Navigable Waterway	Unknown
11. Bylaw No.		14. Low Clearance Sign		18. Bridge Value	$375,000
12. Bylaw Expiry Date	y m	15. Narrow Structure Sign		19. Latitude	
				20. Longitude	

B. RAILWAY OVERPASS/UNDERPASS

21. Railway Level Crossing Number		27. Original Board Order Number	Date y m d
22. Railway Company			
23. Railway Subdivision		28. Current Board Order Number	Date y m d
24. Subdivision Mileage			
25. Transport Canada Crossing No.		29. Seniority	
26. Number of Tracks			

C. JURISDICTION

31. Ownership O	A MUN			38. Local/Area Municipality (Upper Tier Only)
	B	35. Boundary Bridge	N	A.
32. Heritage Status	R			B.
33. Special Designation	NSD	36. Adjacent Municipality Name/No		39. Maintenance Area
34. Suburban Roads Commission		37. Adjacent Bridge No.		40. Municipal Ward

D. EXISTING CONDITIONS

GENERAL		45. Span Length	5.8 m	50. Longitudinal Joints	0
41. Year Constructed	A. 1930	46. Deck Type	CC	51. Transverse Joints	0
	B. 1930	47. Deck Length	7.0 m	52. Number of Bearings	0
42. Bridge Type	C-TB-H	48. Deck Width	5.5 m	53. Soil Condition	U
43. Crossing Skew	0^{o}	49. Deck Area	38.5 m^2	54. Abutment & Foundation Type	Closed - UN
44. Number of Spans	1				

ROAD OVER BRIDGE

		59. No. of Lanes	1	62. Barriers Walls/Railings	CB
55. Existing Road Class	300	60. Median Type/Width		63. Minimum Vertical	
56. Operational Status	2W - OAT	61. Safety Curb/	(A) N	Clearance	
57. Wearing Surface	A	Sidewalk and	(B) N		
58. Travel Deck Width	4.70 m	Curb Barrier			

ROAD UNDER BRIDGE

	68. No. of Lanes		71. Traffic Barrier	
64. Existing Road Class	69. Median Type/Width		72. Minimum Vertical Clearance	
65. Operational Status	70. Safety Curb/	A		
66. Opening Width	Sidewalk and	B		
67. Surface Width	Curb Barrier			

E. TRAFFIC DATA

	TRAFFIC COUNT	10 YEAR TRAFFIC FORECAST
81. Legal Speed Limit	83. Year	90. Year
	84. AADT	91. AADT
82. Route Designations	85. DHV Factor	92. DHV Factor
	86. DHV	93. DHV
Transit ☐ Truck ☐	87. Trucks	94. Trucks
School ☐ Bicycle ☐	88. Peak Directional Split	95. Capacity
	89. 10 Year Growth Factor	96. 20 Year AADT

F. INSPECTIONS & APPROVALS

101. Date:	June 02, 2016	102. Professional Engineer Name	M. Kirby, P. Eng.
Inspected By:	M. Kirby & S. Milne	103. Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL BRIDGE APPRAISAL

G. BRIDGE NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Superstructure	4	5	1-5 yrs
112.	Wearing Surface	5	5	6-10 yrs
113.	Deck Condition	4	5	1-5 yrs
114.	Expansion Joints	0	0	ADEQ
115.	Railings	3	4	1-5 yrs
116.	Substructure	5	5	6-10 yrs
117.	Coating	0	0	ADEQ
118.	Streams/Waterways	5	6	6-10 yrs
119.	Curbs/Sidewalks	0	0	ADEQ

H. FUNCTIONAL NEEDS

ROAD OVER		Existing Condition	Minimum Tolerable	TIME OF NEED
121.	Travel Deck Width	4.7m	6.5m	NOW
122.	Level of Service	A	E	ADEQ
123.	Min. Vert. Clear.		4.5	ADEQ
124.	Sidewalks	N	N	ADEQ

I. ENGINEERING RECOMMENDATIONS

131.	Bridge Drawings			UNK
132.	Engineering Investigations	Type	Year	Cost ($000)
	A			
	B			
	C			
	D			
133.	Total Cost of Engineering Investigations			
134.	Single Posting			
135.	Evaluated Posting			t t t
Date				
136.	Monitoring			
137.	Closure/Date			

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL
142.	Operational Status	2W-OAT
143.	Abutment Type	RSL-O
144.	Design Deck Width	6.5m
145.	Design Deck Length	7.0m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A	RIR	PC		1-5 yrs	10
B	RSP	PC		1-5 yrs	15
C	CDS	PC		1-5 yrs	15
D	IAG	PC		1-5 yrs	40
E	RSL	PC		6-10 yrs	400
F					

K. IMPROVEMENT COST

		Cost ($000)
151.	Construction	80
152.	Approaches	0
153.	Detours	0
154.	Traffic Control/Protection	0
155.	Utilities	0
156.	Other	0
157.	Contingencies 10%	8
158.	Total Construction	88
159.	Right of Way	0
160.	Engineering Environmental Assessment (E/A) Study	0
161.	Engineering Design & Supervision	15
162.	Total Project cost	103
163.	Eligibility for Subsidy	EFS
164.	Non-subsidizable Costs	

		Contributing Agency	Non-Subsid. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Subsidizable Cost	103
167.	Municipal Percent of Subsidizable Cost	100%
168.	Municipal Share of Cost	103

L. HISTORY

ENGINEERING INVESTIGATIONS	Type	Year
171.		
172.		
173.		
174.		
175.		

CONSTRUCTION IMPROVEMENTS	Type	Year
181.		
182.		
183.		
184.		
185.		

M. Inspection Notes

191. **Bridge No. 06, MTO Site No. 38S-153, Black Creek Bridge, Gordon Lake Road - 80m South of Suddaby Park Road, Township of Johnson**

- Structure not posted with a load limit.
- Single span (±5.8 m) cast in place concrete T-beam bridge with a concrete deck and surface treated wearing surface with cast in place concrete railings.
- Concrete railing on deck are in generally fair condition with localized spalls and exposed corroded rebar at the balustrades. The base of the railing and the posts in the southwest quadrant has delamination(s). Scrape damage and spall from snowplow was noted in the northwest corner.
- There are four hazard markers, one at each corner of the bridge. The two signs on the south end of the bridge at bent slightly out of place and the northeast hazard sign is twisted towards the ditch. All signs have scrape damage and/or are leaning.
- Surface treated deck wearing surface and approaches are generally in fair to good condition with moderate wear and abrasions, moderate to wide transverse cracks in the south approach, two localized moderate potholes in deck wearing surface and one localized moderate pothole in south approach. Settlement of the south approach is causing an uneven surface at the end of the bridge deck. Excess winter sand and gravel was noted on bridge at edges of the concrete railings.
- No deck drains are provided on bridge deck.
- Concrete deck soffit is in fair condition with exposed corroded rebar and localized delamination(s) – specifically soffit in the bridge's west quadrant.
- Concrete T-beams are in fair condition with moderate to severe scaling on the lower half with moderate spalls and isolated exposed rebar. Erosion was noted in lower half of beams due to low clearance from water level. Medium to wide crack in the west beam at the south abutment haunch was noted.
- Concrete abutment walls are in generally good condition with moderate to severe erosion noted at and below the waterline.
- No approach guiderails are present at the structure.
- Watercourse is obstructed upstream of the bridge by a fallen tree. No evidence of scour was noted at the structure.
- Vegetated roadway embankments are in fair to good condition. Localized moderate erosion and loss of material was noted in three quadrants immediately adjacent to the corners of the bridge.

Recommendations

- Structure does not require posting with a load limit.
- The cracking of and potholes in the surface treated roadway surface should be sealed or patched.
- The bent and/or leaning signs should be straightened or replaced.
- Moderate potholes in the bridge deck wearing surface should be repaired.
- Should clean deck of gravel buildup and stabilize erosion at the bridge corners as part of regular maintenance.
- Tree in waterway upstream of structure should be removed.
- Should rehabilitate deck barrier, deck soffit, T-beams and install traffic protection on the approaches. Consideration should be given into a total bridge replacement (providing 2 lanes wide on roadway platform) as opposed to rehabilitation of existing due to the age of the structure and that the existing bridge is only a single lane wide.

Bridge Photographs

2.	Municipal Name/Code	Township of Johnson	6.	Bridge No.	06
3.	Bridge Name	Black Creek Bridge	7.	MTO Site No.	38S-153
4.	Road Name	Gordon Lake Road			
5.	Location	80m South of Suddaby Park Road			

LOOKING SOUTH ACROSS STRUCTURE

DECK WEARING SURFACE WITH LIGHT WEAR, ABRASIONS AND LOCALIZED POTHOLES

Bridge Photographs

2.	Municipal Name/Code	Township of Johnson	6.	Bridge No.	06
3.	Bridge Name	Black Creek Bridge	7.	MTO Site No.	38S-153
4.	Road Name	Gordon Lake Road			
5.	Location	80m South of Suddaby Park Road			

UPSTREAM FROM BRIDGE, TREE OBSTRUCTING WATERWAY

TYPICAL RAILING SYSTEM WITH EXPOSED REBAR
(SOUTHWEST QUADRANT)

Bridge Photographs

2.	Municipal Name/Code	Township of Johnson	6.	Bridge No.	06
3.	Bridge Name	Black Creek Bridge	7.	MTO Site No.	38S-153
4.	Road Name	Gordon Lake Road			
5.	Location	80m South of Suddaby Park Road			

EAST ELEVATION

LOCALIZED DELAMINATION WITH EXPOSED CORRODED REBAR IN WEST DECK SOFFIT

Bridge Photographs

2.	Municipal Name/Code	Township of Johnson	6.	Bridge No.	06
3.	Bridge Name	Black Creek Bridge	7.	MTO Site No.	38S-153
4.	Road Name	Gordon Lake Road			
5.	Location	80m South of Suddaby Park Road			

SOUTH ABUTMENT WITH MODERATE TO SEVERE EROSION

MEDIUM TO WIDE CRACK IN SOUTHWEST BEAM HAUNCH

Bridge Photographs

2.	Municipal Name/Code	Township of Johnson	6.	Bridge No.	06
3.	Bridge Name	Black Creek Bridge	7.	MTO Site No.	38S-153
4.	Road Name	Gordon Lake Road			
5.	Location	80m South of Suddaby Park Road			

EAST SOFFIT – GENERAL ARRANGEMENT

SETTLEMENT OF SOUTH APPROACH AND CRACKING OF WEAR SURFACE AT END OF BRIDGE DECK

MUNICIPAL CULVERT APPRAISAL

A. IDENTIFICATION

1.	Control Code	4-S-TP	6.	Culvert No.	02
2.	Municipal Name/Code	Township of Johnson	7.	Road Section No.	375
3.	Culvert Name	Sucker Creek Road	8.	MTO Site No.	
4.	Road Name	Government Road			
5.	Location	1.9 km West of Lake Huron Drive			
9.	Roadside Environment	R	16.	Crossing Type	O-WAT
10.	Posting	t t t	17.	Federal Navigable Waterway	Unknown
11.	Bylaw No.		18.	Culvert Value	$300,000
12.	Bylaw Expiry Date	y m	19.	Latitude	
			20.	Longitude	

13.	Posting Sign	t	
14.	Low Clearance Sign		
15.	Narrow Structure Sign		

B. RAILWAY OVERPASS/UNDERPASS

21.	Railway Level Crossing Number	27.	Original Board Order Number	Date y m d
22.	Railway Company			
23.	Railway Subdivision	28.	Current Board Order Number	Date y m d
24.	Subdivision Mileage			
25.	Transport Canada Crossing No.	29.	Seniority	
26.	Number of Tracks			

C. JURISDICTION

31.	Ownership O	A MUN		38.	Local/Area Municipality (Upper Tier Only)
		B	35. Boundary Bridge/Culvert N	A.	
32.	Heritage Status	R		B.	
33.	Special Designation	CBL	36. Adjacent Municipality Name/No	39.	Maintenance Area
34.	Suburban Roads Commission		37. Adjacent Culvert No.	40.	Municipal Ward

D. EXISTING CONDITIONS

GENERAL

41.	Year Constructed	A. 1980	45.	Cell/Span Width/Dia.	3.0 m	51. End Treatment	**A B C D**
		B.	46.	Total Width/Dia.	3.0 m	Upstream	N
42.	Material Type	CPS-PA	47.	Max. Height	3.0 m	Downstream	N
43.	Crossing Skew	0^{o}	48.	Culvert Length	20.0 m	52. Soil Condition	U
44.	Number of Cells/Spans	1	49.	Type/Depth of Fill	E 0.3 m	53. Foundation Type	UN – Unknown
			50.	Culvert Floor	SC		

ROAD OVER CULVERT

			57.	Surface Type	O	61. Safety Curb/Sidewalk &	(A) N
55.	Existing Road Class	300	58.	Platform Width	8.0 m	Curb Barrier	(B) N
55a.	Highway Classification	-	59.	Surface Width	7.0 m	62. Roadside Safety	(A) N NO
56.	Operational Status	2W OAT	60.	No. of Lanes	2.0		(B) S NO

ROAD THROUGH CULVERT

		66.	Opening Width	70.	Safety Curb/Sidewalk &
64.	Existing Road Class	67.	Surface Width		Curb Barrier
64a.	Highway Classification	68.	No. of Lanes	71.	Traffic Barrier
65.	Operational Status	69.	Median Type/Width	72.	Minimum Vertical Clearance

E. TRAFFIC DATA

81.	Legal Speed Limit		TRAFFIC COUNT		10 YEAR TRAFFIC FORECAST
		83.	Year	90.	Year
		84.	AADT	91.	AADT
82.	Route Designations	85.	DHV Factor	92.	DHV Factor
		86.	DHV	93.	DHV
	Transit ☐ Truck ☐	87.	Trucks	94.	Trucks
	School ☐ Bicycle ☐	88.	Peak Directional Split	95.	Capacity
		89.	10 Year Growth Factor	96.	20 Year AADT

F. INSPECTIONS & APPROVALS

101.	Date:	June 2, 2016	102.	Professional Engineer Name	M. Kirby, P. Eng.
	Inspected By:	M. Kirby & S. Milne	103.	Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL CULVERT APPRAISAL

G. CULVERT NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Barrel	4	5	1-5 yrs
112.	Foundations	6	6	ADEQ
113.	Inlet Components	0	0	ADEQ
114.	Outlet Components	0	0	ADEQ
115.	Guide rail/Barrier	0	0	NOW
116.	Streams/Waterways	6	5	ADEQ

H. FUNCTIONAL NEEDS

		Existing Condition	Minimum Tolerable	TIME OF NEED
	ROAD OVER			
121.	Platform Width	8.0 m	6.5 m	ADEQ
122.	Level of Service	A	E	ADEQ
123.	Roadside Safety	-	3	NOW

I. ENGINEERING RECOMMENDATIONS

131. Culvert Drawings: UNK
131a. Structure Drawing No.:
131b. Road Drawing No.:

132. Engineering Investigations

	Type	Year	Cost ($000)
A	C/S	2017	10
B			
C			
D			

134.	Single Posting	y	m	d	-	
135.	Evaluated Posting Date			t y	t m	t
136.	Monitoring					m
137.	Closure/Date	y	m	d	-	

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL
142.	Design Platform Width	8.0 m
143.	Material/Type	CPS-PR
144.	Width/Diameter	3.0 m
145.	Maximum Height	3.0 m
146.	Culvert Length	20 m
147.	No. of Culverts	1
148.	Depth of Fill	0.3 m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A	RSL	PC		1-5 yrs	300
B	IAG	PC	4	NOW	40
C	EIR	PC		NOW	10
D					
E					
F					
G					
H					
I					
J					

K. IMPROVEMENT COST

			Cost ($000)
151.	Construction		300
152.	Approaches		40
153.	Detours		0
154.	Traffic Control/Protection		0
155.	Utilities		0
156.	Other		0
157.	Contingencies	10%	34
158.	Total Construction		374
159.	Right of Way		0
160.	Engineering Environmental Assessment (E/A) Study		10
161.	Engineering Design & Supervision		50
162.	Total Project cost		434
163.	Eligibility for Subsidy		EFS
164.	Non-subsidizable Costs		

		Contributing Agency	Non-Contrib. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Contributable Cost	434
167.	Municipal Percent of Contributable Cost	100%
168.	Municipal Share of Cost	434

L. HISTORY

ENGINEERING INVESTIGATIONS		Type	Year
171.			
172.			
173.			
174.			
175.			

CONSTRUCTION IMPROVEMENTS		Type	Year
181.			
182.			
183.			
184.			
185.			

M. Inspection Notes

191. **Culvert No. 02, Sucker Creek, Government Road - 1.9 km West of Lake Huron Drive, Township of Johnson:**

- Structure not posted with a load limit.
- Single span (±3.0m) corrugated plate steel round pipe with approximately 0.3m of gravel fill and a surface treated roadway.
- Surface treated roadway is in generally fair to good condition with moderate settlement on either side of the structure and narrow to wide transverse cracks in the surface treatment.
- No traffic protection is provided on the approaches or over the structure.
- Vegetated roadway embankments are in fair condition with localized erosion observed in the northeast and northwest corners adjacent to the pipe inlet.
- Corrugated plate steel pipe is in fair condition with light to moderate corrosion and flaking at the waterline (lower 1/3 of the pipe). Significant sag in the culvert along its length and a moderate bulge in the culvert's east wall were noted.
- Bearer dam is present inside the culvert at the north inlet.
- Moderate to severe scour of the inlet embankment under the pipe was observed. Extents were not visible due to high water levels.

Recommendations

- Structure does not require posting with a load limit.
- Shall install traffic protection on the approaches and over the structure.
- Beaver dam within the culvert should be removed
- Erosion on the north embankments and scour under the pipe inlet should be repaired and stabilized/protected to prevent re-occurrence.
- Should seal cracks in surface treatment to prevent extensive damage to wearing surface at structure. Patching should also be placed to mitigate the depressions on either side of the culvert.
- Expected replacement of culvert should be budgeted in the next 5 years. Alternative option would be to install a liner in the culvert barrel. A culvert hydraulic study would be required to confirm suitability of installing a liner (this alternative was not costed).

Culvert Photographs				
2.	Municipal Name/Code	Township of Johnson	6. Culvert No.	02
3.	Culvert Name	Sucker Creek Culvert	8. MTO Site No.	
4.	Road Name	Government Road		
5.	Location	1.9 km West of Lake Huron Drive		

LOOKING WEST ACROSS STRUCTURE

NORTH ELEVATION

Culvert Photographs			6. Culvert No.	02
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Sucker Creek Culvert		
4.	Road Name	Government Road		
5.	Location	1.9 km West of Lake Huron Drive		

LOOKING NORTH UPSTREAM FOR STRUCTURE

LIGHT TO MODERATE CORROSION OF CULVERT BARREL WITH FLAKING AT WATERLINE

Culvert Photographs			6. Culvert No.	02
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Sucker Creek Culvert		
4.	Road Name	Government Road		
5.	Location	1.9 km West of Lake Huron Drive		

LOOKING NORTH THROUGH CULVERT BARREL

WATER INFILTRATION AT BOLT JOINT IN NORTH SECTION OF WEST WALL

Culvert Photographs				
2.	Municipal Name/Code	Township of Johnson	6. Culvert No.	02
3.	Culvert Name	Sucker Creek Culvert	8. MTO Site No.	
4.	Road Name	Government Road		
5.	Location	1.9 km West of Lake Huron Drive		

SEVERE EROSION AND SCOUR AT CULVERT INLET/NORTHEAST QUADRANT

LOOKING NORTH THROUGH CULVERT BARREL – SIGNIFICANT SAG IN BARREL ALONG ITS LENGTH

MUNICIPAL CULVERT APPRAISAL

A. IDENTIFICATION

1.	Control Code	4-S-TP	6.	Culvert No.	03
2.	Municipal Name/Code	Township Johnson	7.	Road Section No.	
3.	Culvert Name	Sucker Creek near CASS	8.	MTO Site No.	
4.	Road Name	Kensington Point Road			
5.	Location	0.4 km South of Highway 17			
9.	Roadside Environment	R	16.	Crossing Type	O-WAT
10.	Posting	t t t	13. Posting Sign	t	17. Federal Navigable Waterway Unknown
11.	Bylaw No.		14. Low Clearance Sign		18. Culvert Value $400,000
12.	Bylaw Expiry Date		15. Narrow Structure Sign		19. Latitude
					20. Longitude

B. RAILWAY OVERPASS/UNDERPASS

21.	Railway Level Crossing Number	27.	Original Board Order Number Date y m d
22.	Railway Company		
23.	Railway Subdivision	28.	Current Board Order Number Date y m d
24.	Subdivision Mileage		
25.	Transport Canada Crossing No.	29.	Seniority
26.	Number of Tracks		

C. JURISDICTION

31.	Ownership O	A MUN			38. Local/Area Municipality (Upper Tier Only)
		B	35. Boundary Bridge/Culvert	N	A.
32.	Heritage Status	R			B.
33.	Special Designation	CBL	36. Adjacent Municipality Name/No		39. Maintenance Area
34.	Suburban Roads Commission		37. Adjacent Culvert No.		40. Municipal Ward

D. EXISTING CONDITIONS

GENERAL

41.	Year Constructed	A. 1980	45.	Cell/Span Width/Dia.	5.2 m	51. End Treatment	**A B C D**
		B.	46.	Total Width/Dia.	5.2 m	Upstream	N
42.	Material Type	CPS-PA	47.	Max. Height	2.5 m	Downstream	N
43.	Crossing Skew	0^o	48.	Culvert Length	23.5 m	52. Soil Condition	U
44.	Number of Cells/Spans	1	49.	Type/Depth of Fill	E 0.7 m	53. Foundation Type	BD – Bedding
			50.	Culvert Floor	SC		

ROAD OVER CULVERT

			57.	Surface Type	O	61. Safety Curb/Sidewalk &	(A) N /
55.	Existing Road Class	300	58.	Platform Width	6.8 m	Curb Barrier	(B) N /
55a.	Highway Classification	-	59.	Surface Width	5.8 m	62. Roadside Safety	(A) E NO
56.	Operational Status	2W OAT	60.	No. of Lanes	2.0		(B) W NO

ROAD THROUGH CULVERT

		66.	Opening Width	70.	Safety Curb/Sidewalk &
64.	Existing Road Class	67.	Surface Width		Curb Barrier
64a.	Highway Classification	68.	No. of Lanes	71.	Traffic Barrier
65.	Operational Status	69.	Median Type/Width	72.	Minimum Vertical Clearance

E. TRAFFIC DATA

81.	Legal Speed Limit		TRAFFIC COUNT		10 YEAR TRAFFIC FORECAST
		83.	Year	90.	Year
		84.	AADT	91.	AADT
82.	Route Designations	85.	DHV Factor	92.	DHV Factor
		86.	DHV	93.	DHV
Transit ☐	Truck ☐	87.	Trucks	94.	Trucks
School ☐	Bicycle ☐	88.	Peak Directional Split	95.	Capacity
		89.	10 Year Growth Factor	96.	20 Year AADT

F. INSPECTIONS & APPROVALS

101.	Date:	June 2, 2016	102.	Professional Engineer Name	M. Kirby, P. Eng.
	Inspected By:	M. Kirby & S. Milne	103.	Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL CULVERT APPRAISAL

G. CULVERT NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Barrel	4	5	1-5 yrs
112.	Foundations	9	9	ADEQ
113.	Inlet Components	0	0	ADEQ
114.	Outlet Components	0	0	ADEQ
115.	Guide rail/Barrier	0	0	NOW
116.	Streams/Waterways	6	6	ADEQ

H. FUNCTIONAL NEEDS

		Existing Condition	Minimum Tolerable	TIME OF NEED
	ROAD OVER			
121.	Platform Width	6.8 m	6.5 m	ADEQ
122.	Level of Service	A	E	ADEQ
123.	Roadside Safety	-	3	NOW

I. ENGINEERING RECOMMENDATIONS

131.	Culvert Drawings			UNK		
131a.	Structure Drawing No.					
131b.	Road Drawing No.					
132.	Engineering Investigations					
		Type	Year	Cost ($000)		
	A	C/S	2018	10		
	B					
	C					
	D					
134.	Single Posting	y	m	d		
135.	Evaluated Posting Date			t y	t m	t
136.	Monitoring					m
137.	Closure/Date	y	m	d		

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL	
142.	Design Platform Width	6.8	m
143.	Material/Type	CPS-PR	
144.	Width/Diameter	5.2	m
145.	Maximum Height	5.2	m
146.	Culvert Length	23.5	m
147.	No. of Culverts	1	
148.	Depth of Fill	0.7	m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A	IAG	PC	4	NOW	40
B					
C					
D					
E					
F					
G					
H					
I					
J					

K. IMPROVEMENT COST

			Cost ($000)
151.	Construction		0
152.	Approaches		40
153.	Detours		0
154.	Traffic Control/Protection		0
155.	Utilities		0
156.	Other		0
157.	Contingencies	10%	4
158.	Total Construction		44
159.	Right of Way		0
160.	Engineering Environmental Assessment (E/A) Study		10
161.	Engineering Design & Supervision		6
162.	Total Project cost		60
163.	Eligibility for Subsidy		EFS
164.	Non-subsidizable Costs		

		Contributing Agency	Non-Contrib. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Contributable Cost	60
167.	Municipal Percent of Contributable Cost	100%
168.	Municipal Share of Cost	60

L. HISTORY

ENGINEERING INVESTIGATIONS		Type	Year	CONSTRUCTION IMPROVEMENTS		Type	Year
171.				181.			
172.				182.			
173.				183.			
174.				184.			
175.				185.			

M. Inspection Notes

191. **Culvert No. 03, Sucker Creek Near CASS, Kensington Point Road - 0.40 km South of Highway 17, Township of Johnson:**

- Structure not posted with a load limit.
- Single span (±5.2m) corrugated plate steel pipe arch with approximately 0.7m of gravel fill and a surface treated roadway.
- Surface treated roadway is generally in good condition.
- No traffic protection is provided on the approaches or over the structure.
- Vegetated roadway embankments are in fair to good condition.
- Corrugated plate steel pipe is in fair condition with light to moderate corrosion with flaking at the waterline. Two minor bulges in the top of the culvert barrel were noted at the road center line.
- Watercourse is generally un-obstructed with no evidence of scour.

Recommendations

- Structure does not require posting with a load limit.
- Should install traffic protection on the approaches and over the structure.
- Northwest embankment slope appears stable however additional material could be placed to eliminate previous erosion in roadway embankment as part of regular maintenance.
- Should inspect the floor and bottom of walls for extensive corrosion and cracks to better determine the remaining life of the culvert and expected time frame for replacement or repairs. (Anticipate that underwater inspection will be carried out with aid of a diver).

Culvert Photographs			
2.	Municipal Name/Code	Township of Johnson	6. Culvert No. 03
3.	Culvert Name	Sucker Creek Near CASS	8. MTO Site No.
4.	Road Name	Kensington Point Road	
5.	Location	0.40 km South of Highway 17	

LOOKING NORTH ACROSS STRUCTURE

WEST ELEVATION

Culvert Photographs			6. Culvert No.	03
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Sucker Creek Near CASS		
4.	Road Name	Kensington Point Road		
5.	Location	0.40 km South of Highway 17		

LOOKING WEST UPSTREAM FROM STRUCTURE

LOOKING WEST THROUGH CULVERT BARREL

Culvert Photographs			6.	Culvert No.	03
2.	Municipal Name/Code	Township of Johnson	8.	MTO Site No.	
3.	Culvert Name	Sucker Creek Near CASS			
4.	Road Name	Kensington Point Road			
5.	Location	0.40 km South of Highway 17			

LIGHT TO MODERATE CORROSION OF CULVERT BARREL AT WATERLINE

TYPICAL VEGETATED ROADWAY EMBANKMENT

MUNICIPAL CULVERT APPRAISAL

A. IDENTIFICATION

1.	Control Code	4-S-TP	6.	Culvert No.	05
2.	Municipal Name/Code	Township Of Johnson	7.	Road Section No.	260
3.	Culvert Name	Government Road Culvert	8.	MTO Site No.	
4.	Road Name	Government Road			
5.	Location	0.4 km East of Fisher Road			
9.	Roadside Environment	R	16.	Crossing Type	O-WAT
10.	Posting	t t t	17.	Federal Navigable Waterway	Unknown
11.	Bylaw No.	13. Posting Sign	18.	Culvert Value	$400,000
12.	Bylaw Expiry Date	14. Low Clearance Sign	19.	Latitude	
		15. Narrow Structure Sign	20.	Longitude	

B. RAILWAY OVERPASS/UNDERPASS

21.	Railway Level Crossing Number	27.	Original Board Order Number	Date y m d
22.	Railway Company			
23.	Railway Subdivision	28.	Current Board Order Number	Date y m d
24.	Subdivision Mileage			
25.	Transport Canada Crossing No.	29.	Seniority	
26.	Number of Tracks			

C. JURISDICTION

31.	Ownership O	A MUN			38.	Local/Area Municipality (Upper Tier Only)	
		B	35.	Boundary Bridge/Culvert N		A.	
32.	Heritage Status	R				B.	
33.	Special Designation	CBL	36.	Adjacent Municipality Name/No	39.	Maintenance Area	
34.	Suburban Roads Commission		37.	Adjacent Culvert No.	40.	Municipal Ward	

D. EXISTING CONDITIONS

GENERAL							**A**	**B**	**C**	**D**
41.	Year Constructed	A. 1980	45.	Cell/Span Width/Dia.	3.6 m	51. End Treatment				
		B.	46.	Total Width/Dia.	3.6 m	Upstream	N			
42.	Material Type	CSP-PR	47.	Max. Height	3.6 m	Downstream	N			
43.	Crossing Skew	0^{o}	48.	Culvert Length	29.0 m	52. Soil Condition	U			
44.	Number of Cells/Spans	1	49.	Type/Depth of Fill	E 1.0 m	53. Foundation Type	BD – Bedding			
			50.	Culvert Floor	SC					

ROAD OVER CULVERT

		57.	Surface Type	G	61. Safety Curb/Sidewalk &	(A) N
55.	Existing Road Class	300	58.	Platform Width	8.5 m	Curb Barrier (B) N
55a.	Highway Classification	-	59.	Surface Width	7.5 m	62. Roadside Safety (A) N NO
56.	Operational Status	2W - OAT	60.	No. of Lanes	2.0	(B) S NO

ROAD THROUGH CULVERT

		66.	Opening Width	70.	Safety Curb/Sidewalk &
64.	Existing Road Class	67.	Surface Width		Curb Barrier
64a.	Highway Classification	68.	No. of Lanes	71.	Traffic Barrier
65.	Operational Status	69.	Median Type/Width	72.	Minimum Vertical Clearance

E. TRAFFIC DATA

81.	Legal Speed Limit	TRAFFIC COUNT		10 YEAR TRAFFIC FORECAST	
		83.	Year	90.	Year
		84.	AADT	91.	AADT
82.	Route Designations	85.	DHV Factor	92.	DHV Factor
		86.	DHV	93.	DHV
Transit ☐	Truck ☐	87.	Trucks	94.	Trucks
School ☐	Bicycle ☐	88.	Peak Directional Split	95.	Capacity
		89.	10 Year Growth Factor	96.	20 Year AADT

F. INSPECTIONS & APPROVALS

101.	Date:	June 2, 2016	102.	Professional Engineer Name	M. Kirby, P. Eng.
	Inspected By:	M. Kirby & S. Milne	103.	Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL CULVERT APPRAISAL

G. CULVERT NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Barrel	5	6	6-10 yrs
112.	Foundations	9	9	ADEQ
113.	Inlet Components	0	0	ADEQ
114.	Outlet Components	0	0	ADEQ
115.	Guide rail/Barrier	0	0	NOW
116.	Streams/Waterways	6	6	ADEQ

H. FUNCTIONAL NEEDS

		Existing Condition	Minimum Tolerable	TIME OF NEED
	ROAD OVER			
121.	Platform Width	8.5 m	6.5 m	ADEQ
122.	Level of Service	A	E	ADEQ
123.	Roadside Safety	-	3	NOW

I. ENGINEERING RECOMMENDATIONS

131.	Culvert Drawings		UNK
131a.	Structure Drawing No.		
131b.	Road Drawing No.		

132. Engineering Investigations

	Type	Year	Cost ($000)
A			
B			
C			
D			

134.	Single Posting	y	m	d	-	
135.	Evaluated Posting Date			t y	t m	t
136.	Monitoring					m
137.	Closure/Date	y	m	d	-	

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL	
142.	Design Platform Width	8.5	m
143.	Material/Type	CPS-PR	
144.	Width/Diameter	3.6	m
145.	Maximum Height	3.6	m
146.	Culvert Length	29.0	m
147.	No. of Culverts	1	
148.	Depth of Fill	1.0	m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A	RSL	PC		6-10 yrs	400
B	IAG	PC	4	NOW	40
C					
D					
E					
F					
G					
H					
I					
J					

K. IMPROVEMENT COST

			Cost ($000)
151.	Construction		400
152.	Approaches		40
153.	Detours		0
154.	Traffic Control/Protection		0
155.	Utilities		0
156.	Other		0
157.	Contingencies	10%	44
158.	Total Construction		484
159.	Right of Way		0
160.	Engineering Environmental Assessment (E/A) Study		10
161.	Engineering Design & Supervision		60
162.	Total Project cost		554
163.	Eligibility for Subsidy		EFS
164.	Non-subsidizable Costs		

		Contributing Agency	Non-Contrib. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Contributable Cost	554
167.	Municipal Percent of Contributable Cost	100%
168.	Municipal Share of Cost	554

L. HISTORY

ENGINEERING INVESTIGATIONS		Type	Year
171.			
172.			
173.			
174.			
175.			

CONSTRUCTION IMPROVEMENTS		Type	Year
181.			
182.			
183.			
184.			
185.			

M. Inspection Notes

- **Culvert No. 05, Government Road Culvert, Government Road – 0.4 km East of Fisher Road, Township of Johnson:**

- Structure is not posted with a load limit.
- Single span (±3.6m) corrugated steel round pipe culvert with approximately 1.0 m of gravel fill and a finished gravel roadway.
- Gravel roadway and approaches are in good condition with light washboard over the culvert.
- No traffic protection is provided on the approaches or across the structure.
- Vegetation and rock protected roadway embankments are in good condition.
- Steel culvert is generally in fair to good condition with light to moderate corrosion of the barrel floor, the seams are slightly open and first segment from north at the seam has a bent/damaged portion at the floor level and the barrel is slightly out of round. A projection (bulge) was noted on east wall of the culvert barrel at approximately the center line of road. Parging of culvert barrel joints has failed and sections missing throughout.
- Culvert inlet is perched and undermined allowing water to pass under/along the outside base of the culvert through the roadway.
- Sag in culvert floor along culvert barrel at 1st joint from the outlet with area of polling water.
- Watercourse is un-obstructed with no evidence of scour.

Recommendations

- Structure does not require posting with a load limit.
- Should install guiderails on the approaches and across the structure
- Roadway should be graded to remove washboard as part of regular maintenance.
- The missing parging and opened seams should be repaired as part of your regular maintenance program to prevent water from travelling under the culvert.
- Monitor bulging of culvert barrel at centerline of roadway/culvert barrel.
- Expected replacement of culvert should be budgeted in the next 6-10 years. Alternative option would be to install a liner in the culvert barrel. A culvert hydraulic study would be required to confirm suitability of installing a liner (this alternative was not costed).

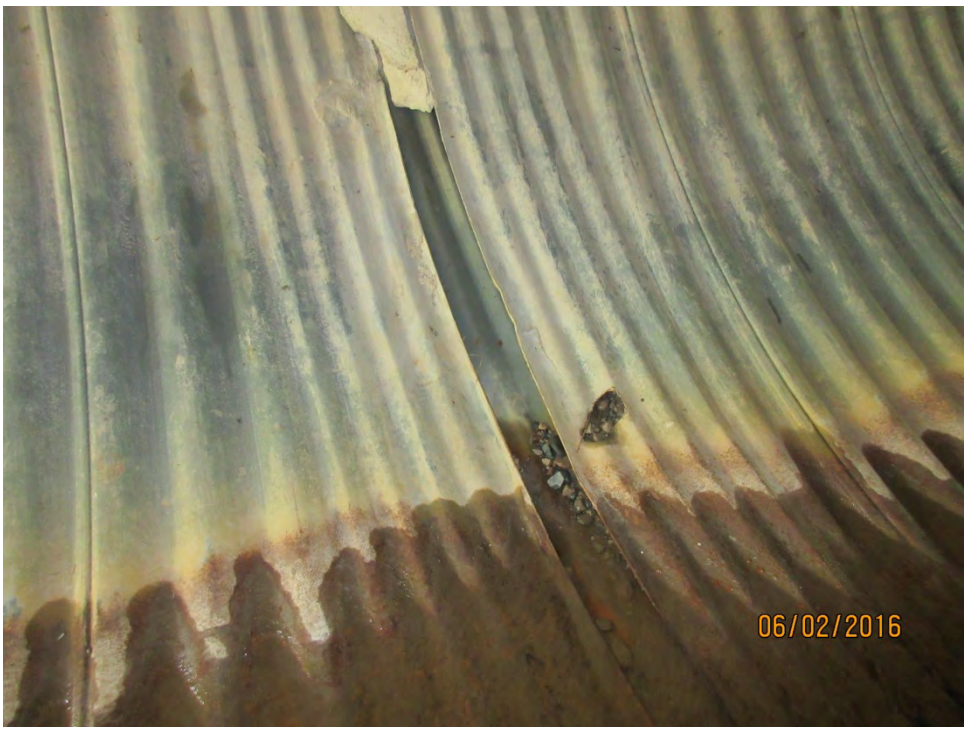
Culvert Photographs			6. Culvert No.	05
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Government Road Culvert		
4.	Road Name	Government Road		
5.	Location	0.4 km East of Fisher Road		

LOOKING WEST ACROSS STRUCTURE

LOOKING UPSTREAM FROM CULVERT

Culvert Photographs				
2.	Municipal Name/Code	Township of Johnson	6. Culvert No.	05
3.	Culvert Name	Government Road Culvert	8. MTO Site No.	
4.	Road Name	Government Road		
5.	Location	0.4 km East of Fisher Road		

LOOKING NORTH THROUGH BARREL



TYPICAL OVERLAP JOINT MISSING PARGING

Culvert Photographs			6. Culvert No.	05
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Government Road Culvert		
4.	Road Name	Government Road		
5.	Location	0.4 km East of Fisher Road		

LOCALIZED PROJECTION ON EAST WALL

CULVERT INLET WITH MODERATE UNDERMINING

Culvert Photographs				
2.	Municipal Name/Code	Township of Johnson	6. Culvert No.	05
3.	Culvert Name	Government Road Culvert	8. MTO Site No.	
4.	Road Name	Government Road		
5.	Location	0.4 km East of Fisher Road		

NORTH ELEVATION

MUNICIPAL CULVERT APPRAISAL

A. IDENTIFICATION					
1. Control Code	4-S-TP			6. Culvert No.	07
2. Municipal Name/Code	Township of Johnson			7. Road Section No.	380
3. Culvert Name	Sucker Creek Culvert			8. MTO Site No.	
4. Road Name	Puddingstone Road				
5. Location	2.1 km North of Government Road				
9. Roadside Environment	R			16. Crossing Type	O-WAT
10. Posting	t t t	13. Posting Sign	t	17. Federal Navigable Waterway	U
11. Bylaw No.		14. Low Clearance Sign		18. Culvert Value	$400,000
12. Bylaw Expiry Date	y m	15. Narrow Structure Sign		19. Latitude	
				20. Longitude	

B. RAILWAY OVERPASS/UNDERPASS			
21. Railway Level Crossing Number		27. Original Board Order Number	Date y m d
22. Railway Company			
23. Railway Subdivision		28. Current Board Order Number	Date y m d
24. Subdivision Mileage			
25. Transport Canada Crossing No.		29. Seniority	
26. Number of Tracks			

C. JURISDICTION					
31. Ownership O	A MUN			38. Local/Area Municipality (Upper Tier Only)	
	B	35. Boundary	Yes	A.	
32. Heritage Status	R	Bridge/Culvert		B.	
33. Special Designation	CBL			39. Maintenance Area	
34. Suburban Roads Commission		36. Adjacent Municipality Name/No	Twp. of Tarbutt & Tarbutt Additional	40. Municipal Ward	
		37. Adjacent Culvert No.			

D. EXISTING CONDITIONS					
GENERAL		45. Cell/Span Width/Dia.	5.0 m	51. End Treatment	**A B C D**
41. Year Constructed	A. 2000	46. Total Width/Dia.	5.0 m	Upstream	N
	B.	47. Max. Height	2.0 m	Downstream	N
42. Material Type	CPS-PA	48. Culvert Length	18.0 m	52. Soil Condition	U
43. Crossing Skew	0^{o}	49. Type/Depth of Fill	E 0.8 m	53. Foundation Type	UN – Unknown
44. Number of Cells/Spans	1	50. Culvert Floor	EA		

ROAD OVER CULVERT					
		57. Surface Type	G	61. Safety Curb/Sidewalk &	(A) N
55. Existing Road Class	300	58. Platform Width	8.0 m	Curb Barrier	(B) N
55a. Highway Classification	-	59. Surface Width	7.0 m	62. Roadside Safety	(A) E SC
56. Operational Status	2W OAT	60. No. of Lanes	2.0		(B) W SC

ROAD THROUGH CULVERT			
	66. Opening Width	70. Safety Curb/Sidewalk &	
64. Existing Road Class	67. Surface Width	Curb Barrier	
64a. Highway Classification	68. No. of Lanes	71. Traffic Barrier	
65. Operational Status	69. Median Type/Width	72. Minimum Vertical Clearance	

E. TRAFFIC DATA	TRAFFIC COUNT	10 YEAR TRAFFIC FORECAST
81. Legal Speed Limit	83. Year	90. Year
	84. AADT	91. AADT
82. Route Designations	85. DHV Factor	92. DHV Factor
	86. DHV	93. DHV
Transit ☐ Truck ☐	87. Trucks	94. Trucks
School ☐ Bicycle ☐	88. Peak Directional Split	95. Capacity
	89. 10 Year Growth Factor	96. 20 Year AADT

F. INSPECTIONS & APPROVALS			
101. Date:	June 2, 2016	102. Professional Engineer Name	M. Kirby, P. Eng.
Inspected By:	M. Kirby & S. Milne	103. Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL CULVERT APPRAISAL

G. CULVERT NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Barrel	6	6	ADEQ
112.	Foundations	9	9	ADEQ
113.	Inlet Components	0	0	ADEQ
114.	Outlet Components	0	0	ADEQ
115.	Guide rail/Barrier	3	4	1-5 yrs
116.	Streams/Waterways	6	6	ADEQ

H. FUNCTIONAL NEEDS

		Existing Condition	Minimum Tolerable	TIME OF NEED
	ROAD OVER			
121.	Platform Width	8.0 m	6.5 m	ADEQ
122.	Level of Service	A	E	ADEQ
123.	Roadside Safety	3	3	1-5 yrs

I. ENGINEERING RECOMMENDATIONS

131.	Culvert Drawings	UNK
131a.	Structure Drawing No.	
131b.	Road Drawing No.	

132. Engineering Investigations

	Type	Year	Cost ($000)
A			
B			
C			
D			

134.	Single Posting	y	m	d	-	
135.	Evaluated Posting Date			t y	t m	t
136.	Monitoring					m
137.	Closure/Date	y	m	d	-	

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	
142.	Design Platform Width	m
143.	Material/Type	
144.	Width/Diameter	m
145.	Maximum Height	m
146.	Culvert Length	m
147.	No. of Culverts	
148.	Depth of Fill	m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					

K. IMPROVEMENT COST

		Cost ($000)
151.	Construction	0
152.	Approaches	0
153.	Detours	0
154.	Traffic Control/Protection	0
155.	Utilities	0
156.	Other	0
157.	Contingencies 10%	0
158.	Total Construction	0
159.	Right of Way	0
160.	Engineering Environmental Assessment (E/A) Study	0
161.	Engineering Design & Supervision	0
162.	Total Project cost	0
163.	Eligibility for Subsidy	EFS
164.	Non-subsidizable Costs	

		Contributing Agency	Non-Contrib. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Contributable Cost	0
167.	Municipal Percent of Contributable Cost	100%
168.	Municipal Share of Cost	0

L. HISTORY

ENGINEERING INVESTIGATIONS	Type	Year	CONSTRUCTION IMPROVEMENTS	Type	Year
171.			181.		
172.			182.		
173.			183.		
174.			184.		
175.			185.		

M. Inspection Notes

191. **Culvert No. 07, Sucker Culvert, Puddingstone Road - 2.1 km North of Government Road, Township of Johnson:**

- Structure not posted with a load limit.
- Single (+/-5.0m) span corrugated plate steel open footing arch with approximately 0.8 m of gravel fill and a gravel roadway.
- Gravel roadway is in good condition with light washboard.
- Steel cable guiderail on timber posts is provided on the approaches and is in generally good condition. The cables were crossed at the southeast quadrant and a number of broken guiderail posts are causing the cables to be loose. The posts generally have wide splits and checks with minor decay. The approach 3 cable guiderail have buried end treatments.
- Rock protection is provided on both roadway embankments and is in good condition with a loss of rock armoring near the inlet of the culvert which has been pushed further into structure.
- Corrugated steel plate culvert is in good condition with light water staining of the culvert barrel at the water level..
- Water course is un-obstructed with no evidence of scour.

Recommendations

- Structure does not require posting with a load limit.
- Should repair guiderail cables and replace broken posts as part of regular maintenance. The guiderail posts should be checked seasonally for broken or severely decayed posts.
- Lost armoring stone at the culvert inlet should be replaced to protect the walls of the structure.

Culvert Photographs			6. Culvert No.	07
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Sucker Creek Culvert		
4.	Road Name	Puddingstone Road		
5.	Location	2.1 km North of Government Road		

LOOKING NORTH ACROSS STRUCTURE

WEST ELEVATION

Culvert Photographs			6. Culvert No.	07
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Sucker Creek Culvert		
4.	Road Name	Puddingstone Road		
5.	Location	2.1 km North of Government Road		

TYPICAL ROCK PROTECTION AND EMBANKMENT

LOOKING EAST THROUGH CULVERT BARREL

Culvert Photographs			6. Culvert No.	07
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Sucker Creek Culvert		
4.	Road Name	Puddingstone Road		
5.	Location	2.1 km North of Government Road		

LIGHT STAINING OF CULVERT BARREL AT WATERLINE AND LOSS OF ARMORING STONE AT INLET

BROKEN GUIDERAIL POST ALONG EAST GUIDERAIL

Culvert Photographs			6. Culvert No.	07
2.	Municipal Name/Code	Township of Johnson	8. MTO Site No.	
3.	Culvert Name	Sucker Creek Culvert		
4.	Road Name	Puddingstone Road		
5.	Location	2.1 km North of Government Road		

LOOKING WEST UPSTREAM FROM STRUCTURE

MUNICIPAL CULVERT APPRAISAL

A. IDENTIFICATION

1.	Control Code	4-S-TP	6.	Culvert No.	08
2.	Municipal Name/Code	Township of Johnson	7.	Road Section No.	485
3.	Culvert Name	Sucker Creek Culvert	8.	MTO Site No.	
4.	Road Name	MacDonald Drive			
5.	Location	0.4 km North of Highway 17			
9.	Roadside Environment	R	16.	Crossing Type	O-WAT
10.	Posting	t t t	13. Posting Sign	t	17. Federal Navigable Waterway Unknown
11.	Bylaw No.		14. Low Clearance Sign		18. Culvert Value $350,000
12.	Bylaw Expiry Date	y m	15. Narrow Structure Sign		19. Latitude
					20. Longitude

B. RAILWAY OVERPASS/UNDERPASS

21.	Railway Level Crossing Number	27.	Original Board Order Number Date y m d
22.	Railway Company		
23.	Railway Subdivision	28.	Current Board Order Number Date y m d
24.	Subdivision Mileage		
25.	Transport Canada Crossing No.	29.	Seniority
26.	Number of Tracks		

C. JURISDICTION

31.	Ownership O	A MUN		38.	Local/Area Municipality (Upper Tier Only)
		B	35. Boundary Bridge/Culvert N		A.
32.	Heritage Status	R			B.
33.	Special Designation	CBL	36. Adjacent Municipality Name/No	39.	Maintenance Area
34.	Suburban Roads Commission		37. Adjacent Culvert No.	40.	Municipal Ward

D. EXISTING CONDITIONS

GENERAL

41.	Year Constructed	A. 2000	45.	Cell/Span Width/Dia.	5.5 m	51. End Treatment	**A B C D**
		B.	46.	Total Width/Dia.	5.5 m	Upstream	N
42.	Material Type	CPS-PA	47.	Max. Height	2.1 m	Downstream	N
43.	Crossing Skew	0^{o}	48.	Culvert Length	14.3 m	52. Soil Condition	U
44.	Number of Cells/Spans	1	49.	Type/Depth of Fill	E 0.7 m	53. Foundation Type	Unknown
			50.	Culvert Floor	EA		

ROAD OVER CULVERT

			57.	Surface Type	G	61. Safety Curb/Sidewalk &	(A) N
55.	Existing Road Class	300	58.	Platform Width	6.0 m	Curb Barrier	(B) N
55a.	Highway Classification	-	59.	Surface Width	5.0 m	62. Roadside Safety	(A) N NO
56.	Operational Status	2W OAT	60.	No. of Lanes	2		(B) S NO

ROAD THROUGH CULVERT

		66.	Opening Width	70.	Safety Curb/Sidewalk &
64.	Existing Road Class	67.	Surface Width		Curb Barrier
64a.	Highway Classification	68.	No. of Lanes	71.	Traffic Barrier
65.	Operational Status	69.	Median Type/Width	72.	Minimum Vertical Clearance

E. TRAFFIC DATA

81.	Legal Speed Limit		TRAFFIC COUNT		10 YEAR TRAFFIC FORECAST
		83.	Year	90.	Year
		84.	AADT	91.	AADT
82.	Route Designations	85.	DHV Factor	92.	DHV Factor
		86.	DHV	93.	DHV
	Transit ☐ Truck ☐	87.	Trucks	94.	Trucks
	School ☐ Bicycle ☐	88.	Peak Directional Split	95.	Capacity
		89.	10 Year Growth Factor	96.	20 Year AADT

F. INSPECTIONS & APPROVALS

101.	Date:	June 2, 2016	102.	Professional Engineer Name	M. Kirby, P. Eng.
	Inspected By:	M. Kirby & S. Milne	103.	Municipality/Company	Tulloch Engineering Inc.

MUNICIPAL CULVERT APPRAISAL

G. CULVERT NEEDS

		RATING MCR	PCR	TIME OF NEED
111.	Barrel	6	6	ADEQ
112.	Foundations	9	9	ADEQ
113.	Inlet Components	0	0	ADEQ
114.	Outlet Components	0	0	ADEQ
115.	Guide rail/Barrier	0	0	NOW
116.	Streams/Waterways	5	6	6-10 yrs

H. FUNCTIONAL NEEDS

		Existing Condition	Minimum Tolerable	TIME OF NEED
	ROAD OVER			
121.	Platform Width	6.0 m	6.5 m	NOW
122.	Level of Service	A	E	ADEQ
123.	Roadside Safety	-	3	ADEQ

I. ENGINEERING RECOMMENDATIONS

131.	Culvert Drawings		UNK
131a.	Structure Drawing No.		
131b.	Road Drawing No.		

132. Engineering Investigations

	Type	Year	Cost ($000)
A			
B			
C			
D			

134.	Single Posting	y	m	d	-	
135.	Evaluated Posting Date			t y	t m	t
136.	Monitoring					m
137.	Closure/Date	y	m	d	-	

J. TYPE & TIME OF IMPROVEMENT

141.	Design Class	RSL	
142.	Design Platform Width	9.0	m
143.	Material/Type	CPS-PR	
144.	Width/Diameter	2.5	m
145.	Maximum Height	2.5	m
146.	Culvert Length	22.0	m
147.	No. of Culverts	1	
148.	Depth of Fill	1.5	m

146.

	a Type of Improvement	b Costing Category	c Quantity	d Time of Improvement	e Cost ($000)
A	IAG	PC	4	NOW	40
B					
C					
D					
E					
F					
G					
H					
I					
J					

K. IMPROVEMENT COST

			Cost ($000)
151.	Construction		40
152.	Approaches		0
153.	Detours		0
154.	Traffic Control/Protection		0
155.	Utilities		0
156.	Other		0
157.	Contingencies	10%	4
158.	Total Construction		44
159.	Right of Way		0
160.	Engineering Environmental Assessment (E/A) Study		0
161.	Engineering Design & Supervision		8
162.	Total Project cost		52
163.	Eligibility for Subsidy		EFS
164.	Non-subsidizable Costs		

		Contributing Agency	Non-Contrib. Cost
	A		
	B		
	C		
	D		

165.	Total Non-Subsidizable Cost	
166.	Contributable Cost	52
167.	Municipal Percent of Contributable Cost	100%
168.	Municipal Share of Cost	52

L. HISTORY

ENGINEERING INVESTIGATIONS		Type	Year
171.			
172.			
173.			
174.			
175.			

CONSTRUCTION IMPROVEMENTS		Type	Year
181.			
182.			
183.			
184.			
185.			

M. Inspection Notes

191. **Culvert No. 08, Sucker Creek Culvert, MacDonald Drive - 0.40 km North of Highway 17, Township of Johnson**

- Structure is not posted with a load limit.
- Single span (± 5.5 m) corrugated plate steel plate arch culvert with approximately 0.7 m of gravel fill and a gravel roadway.
- Gravel roadway is in good condition.
- No traffic protection is provided on the approaches or across the structure.
- Vegetated and rock protected roadway embankments are in good condition.
- Corrugated plate steel pipe is in good condition. Light surface corrosion, minor staining and light blistering was noted on the culvert barrel at the water level.
- Water course is generally un-obstructed with no evidence of scour. Some minor wood debris was caught at culvert inlet on the creek bank vegetation and also on the page wire fencing immediately downstream of culvert.

Recommendations

- Structure does not require posting with a load limit.
- The minor wood and grass debris obstructing the waterway, both upstream and downstream should be removed as part of regular maintenance.
- Traffic protection should be installed on the approaches and over the structure.

Culvert Photographs

2.	Municipal Name/Code	Township of Johnson	6.	Culvert No.	08
3.	Culvert Name	Sucker Creek Culvert	7.	MTO Site No.	
4.	Road Name	MacDonald Drive			
5.	Location	0.40 km North of Highway 17			

LOOKING WEST ACROSS STRUCTURE

SOUTH ELEVATION

Culvert Photographs			6. Culvert No.	08
2.	Municipal Name/Code	Township of Johnson	7. MTO Site No.	
3.	Culvert Name	Sucker Creek Culvert		
4.	Road Name	MacDonald Drive		
5.	Location	0.40 km North of Highway 17		

LOOKING NORTH UPSTREAM FROM STRUCTURE

TYPICAL ROCK PROTECTION ON ROADWAY EMBANKMENT

Culvert Photographs			6. Culvert No.	08
2.	Municipal Name/Code	Township of Johnson	7. MTO Site No.	
3.	Culvert Name	Sucker Creek Culvert		
4.	Road Name	MacDonald Drive		
5.	Location	0.40 km North of Highway 17		

LOOKING NORTH THROUGH BARREL

LIGHT STAINING AND BLISTERING OF COATING
AT WATERLINE – SOUTHEAST QUADRANT

Appendix B

Municipal Bridge Inventory

Appendix B - Township of Johnson
2016 Municipal Bridge & Culvert Inventory

Bridge No.	Priority Ranking	Bridge Name	Bridge Location	Crossing Type	Year of Const	Bridge Value ($1,000's)	Bridge Type	No. of Spans	Deck Length (m)	Deck Width (m)	Eng Invest Type/Year/ $1,000'S	Type of Improv	Cost Cat	Time of Improv	Constrn Cost in $1,000's	Total Proj.Cost $1,000's
1	9	Shewfelt Creek Bridge (at Oikari's)	Gordon Lake Road - 0.9km North of Hwy. 17	O-WAT	2006	500	S-EA-F	1	6.2	10.3	-	IAG	PC	1-5 yrs	10	12.5
2	4	Shewfelt Creek (at Grasley's)	Fisher Road – 3.3km North of Hwy. 17	O-WAT	1950	350	C-TB-F	1	7.0	5.1	-	RSB RSP IAG	PC PC PC	1-5 yrs 1-5 yrs 1-5 yrs	15 10 40	81
3	5	Stobie Creek Bridge	Government Road – 10m West of Gordon Lake Road	O-WAT	1937	450	C-TB-F	1	10.1	5.7	-	RSB IAG	PC PC	1-5 yrs 1-5 yrs	30 30	76
4	1	Suddaby Creek Bridge	Old Mill Road - 0.2km North of Gordon Lake Road	O-WAT	1913	750	C-TB-C	3	21.3	5.3	DCS/2017/ 10 RRA/2017/ 5	RIR IAG EIR RSB/RSP OWP Or RSL	PC PC PC PC PC PC	NOW 1-5 yrs 1-5 yrs 1-5 yrs 1-5 yrs 1-5 yrs	25 40 10 200 25 1,000	370
5	10	Suddaby Park Bridge	Gordon Lake Road - 0.3km North of Suddaby Park Road	O-WAT	2009	500	P-BC-F	1	5.3	13.0	-	-	-	-	-	-
6	3	Black Creek Bridge	Gordon Lake Road – 80m South of Suddaby Park Road	O-WAT	1930	375	C-TB-F	1	7.0	5.5	-	RIR RSP CDS IAG RSL	PC PC PC PC PC	1-5 yrs 1-5 yrs 1-5 yrs 1-5 yrs 6-10 yrs	10 15 15 40 400	103**

Note: Total Municipal Bridge Value ($1,000's) = $2,925
Total Municipal Bridge Construction Needs ($1,000's) = $642.5
*** The engineering investigation(s) recommended will provide more information on the condition of non-visible primary elements and will determine the associated timeframe for repairs and/or replacement.**
**** This project cost is for the rehabilitation costs. Additional project costs would be required during total replacement of the structure.**

Culvert No.	Priority Ranking	Culvert Name	Culvert Location	Crossing Type	Year of Const	Culvert Value ($1,000's)	Culvert Type	No. of Spans	Culvert Length (m)	Culvert Width (m)	Eng Invest Type/Year/ $1,000'S	Type of Improv	Cost Cat	Time of Improv	Constrn Cost in $1,000's	Total Proj.Cost $1,000's
1	-	Desbarats River Culvert	Government Road – 2.0 km West of Gordon Lake Road	New Culvert, not inspected on township's request												
2	2	Sucker Creek Culvert	Government Road – 1.9km West of Lake Huron Drive	O-WAT	1980	300	CPS-PR	1	20	3.0	C/S / 2016 / 10	IAG RSL	PC PC	NOW 1-5 yrs	40 300	434
3	7	Sucker Creek (Near Cass)	Kensington Point Road - 0.4km South of Hwy. 17	O-WAT	1980	400	CPS-PR	1	23.5	5.2	C/S / 2016 / 10	IAG	PC	NOW	40	60
4	-	Desbarats River Culvert	Boyer Drive – 30m South of Hwy. 17	O-WAT	2008	450	PCC-BOX	1	17.7	5.6	Not inspected as per township's request					
5	6	Government Road Culvert	Government Road – 0.4km East of Fisher Road	O-WAT	1980	400	CPS-PR	1	29.0	3.6	-	IAG RSL	PC PC	NOW 6-10 yrs	40 400	554
6		Does not exist as part of the asset management plan														
7	11	Sucker Creek Culvert	Puddingstone Road – 2.1 km North of Government Road	O-WAT	2000	400	CPS-PA	1	18.0	5.0	-	-	-	-	-	-
8	8	Sucker Creek Culvert	MacDonald Drive – 0.4km North of Hwy. 17	O-WAT	2000	350	CPS-PA	1	14.3	5.5	-	IAG	PC	NOW	40	52

Note: Total Municipal Culvert Value ($1,000's) = $1,850
Total Municipal Culvert Construction Needs ($1,000's) = *$1,100**
***** The engineering investigation(s) recommended will provide more information on the condition of non-visible primary elements and will determine the associated timeframe for repairs and/or replacement.**