CONCESSION 4 (WOODHOUSE) CULVERT

Site Number 970505

COUNTY ROAD 5, WOODHOUSE

0.2 km S of Concession 5 Road

Ontario Structure Inspection Manual - Inspection Form **Site Number:** 970505

Inventory Data:

Structure Name	Concession 4 (Woodhouse) Culvert						
Main Hwy/Road #	COCKSHUTT RD	[X] On [ ] Under	Crossing Type:	[ ] Rail	[ ] Road	[ ] Navig. Water	[X] Non-Navig. Water
				[ ] Ped.	[ ] Other		
Hwy/Road Name	COUNTY ROAD 5, WOODHOUSE						
Structure Location	0.2 km S of Concession 5 Road						
Latitude	42d 49' 59.6" N		Longitude	80d 12' 39.6" W			
Owner(s)	Norfolk County		Heritage Designation:	[X] Not Cons.	[ ] List/not Design.	[ ] Desig. & List	
				[ ] Cons./not App.	[ ] Desig./not List		
MTO Region	30 Southwestern		Road Class:	[ ] Freeway	[ ] Arterial	[ ] Collector	[X] Local
MTO District	31 London / Stratford		Posted Speed	80	No. of Lanes	2	
Old County	20 Norfolk		AADT	2755	% Trucks		
Geographic Twp.	215 Woodhouse		Inspection Route Sequence				
Structure Type	12 Rectangular Culvert		Interchange Number				
Total Deck Length	5.5 (m)		Interchange Structure Number				
Overall Str. Width	33.4 (m)		Min. Vertical Clearance	2.2 (m)			
Total Deck Area	183.7 (m^2)		Special Route	[ ] Truck	[ ] Emergency	[X] School	[ ] Bicycle
Roadway Width	12.7 (m)		Detour Length Around Bridge	10 (km)			
Skew Angle	(Degrees)		Direction of Structure	East / West			
No. of Spans	1		Fill on Structure	3 (m)			
Span Length	4.3 (m)						

Historical Data:

Year Built	1953	Year of Last Major Rehab.	
Last OSIM Inspection	May 28, 2014	Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat, lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

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Field Inspection Information:			
Date of Inspection:	July 29, 2016	Type of Inspection:	[X] OSIM [ ] Enhanced OSIM
Inspector:	Jason Timmermans, B.Eng., EIT, G. Douglas Vallee Ltd.		
Others in Party:	N/A		
Access Equipment Used:	Hammer, Binoculars, Measuring Tape, Camera, etc.		
Weather:	Sunny		
Temperature:	24 ^{o}C		

Additional Investigation Required:		Priority		
		None	Normal	Urgent
Material Condition Survey				
X	Detailed Deck Condition Survey:	X		
X	Non-destructive Delamination Survey of Asphalt-Covered Deck:	X		
X	Concrete Substructure Condition Survey:	X		
X	Detailed Coating Condition Survey:	X		
X	Detailed Timber Investigation	X		
X	Post-Tensioned Strand Investigation	X		
Underwater Investigation:		X		
Fatigue Investigation:		X		
Seismic Investigation:		X		
Structure Evaluation:		X		
Monitoring				
X	Monitoring of Deformations, Settlements and Movements:	X		
X	Monitoring Crack Widths:	X		

Investigation Notes:
No hazard signs or barriers.

Overall Structure Notes:			
Recommended Work on Structure:	[ ] None	[ ] Minor Rehab.	[ ] Replace
	[X] Maintenance	[ ] Major Rehab.	
Timing of Recommended Work:	[ ] 1 to 5 years	[ ] 6 to 10 years	
Overall Comments:			
Date of next Inspection:	July 29, 2018		

Suspected Performance Deficiencies

01	Load carrying capacity	**07**	Bearing not uniformly loaded/unstable	**12**	Slippery surfaces
02	Excessive deformations (deflections & rotations)	**08**	Jammed expansion joint	**13**	Flooding/channel blockage
03	Continuing settlement	**09**	Pedestrian/vehicular hazard	**14**	Undermining of foundation
04	Continuing movements	**10**	Rough riding surface	**15**	Unstable embankments
05	Seized bearings	**11**	Deck drainage	**16**	Other

Maintenance Needs

01	Lift and swing bridge maintenance	**07**	Repair to structural steel	**13**	Erosion control at bridges
02	Bridge cleaning	**08**	Repair of bridge concrete	**14**	Concrete sealing
03	Bridge handrail maintenance	**09**	Repair of bridge timber	**15**	Rout and seal
04	Painting steel bridge structures	**10**	Bailey bridges - maintenance	**16**	Bridge deck drainage
05	Bridge deck joint repair	**11**	Animal/pest control	**17**	Scaling (Loose concrete or ACR steel)
06	Bridge bearing maintenance	**12**	Bridge surface repair	**18**	Other

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Rehabilitation Required:		Element	Priority				Estimated Construction Cost
Rehab	Replace		Urgent	Within 1 yr	1-5 yrs	6-10 yrs	
		Wearing Surface (Approaches)					
		Barrels					
		Inlet Components					
		Outlet Components					
		Embankments					
		Foundation (below ground level)					
						Total Cost	$0

Associated Work:	Comments	Estimated Construction Cost
Additional Investigations		
Traffic Management		
Utilities		
Road Allowance		
Environmental Assessment		
Engineering		
Other		
Contingencies		
	Total Cost	$0

Justification:

Notes:

Construction Cost:	$0
Associated Work Cost:	$0
TOTAL Estimated Cost:	$0

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Element Data

Element Group:	1600	Approaches				Length:	
Element Name:	1601	Wearing Surface (Approaches)				Width:	
Location:		Top of Fill				Height:	
Material:	2	Asphalt				Count:	1
Element Type:						Total Quantity:	1 All
Environment:		Severe				Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	All	0	0.8	0.2	0

Comments:
Surface shows large crack over culvert with minor settlement.

Recommended Work: Rehab ☐ Replace ☐ Maintenance Needs: Rout and Seal

Timing: Urgent ☐ < 1yr ☐ 1 - 5 yr ☐ 6 - 10 yr ☐ ☐ Urgent ☐ 1 year ☒ 2 year

Element Group:	1200	Culverts				Length:	33.4
Element Name:	1203	Barrels				Width:	4.3
Location:		Inside				Height:	2.2
Material:	4	Cast-in-place Concrete				Count:	1
Element Type:						Total Quantity:	290.6 sq.m
Environment:		Severe				Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	sq.m	0	280.6	10	0

Comments:
Minor leaks at cold joints. There is a bulge at mid-span in north wall caused during construction and leaking (approximately 2m long and 1.2m high). South wall has crack and is leaking.

Recommended Work: Rehab ☐ Replace ☐ Maintenance Needs: Concrete Sealing

Timing: Urgent ☐ < 1yr ☐ 1 - 5 yr ☐ 6 - 10 yr ☐ ☐ Urgent ☐ 1 year ☒ 2 year

Element Group:	1200	Culverts				Length:	5.5
Element Name:	1201	Inlet Components				Width:	0.4
Location:						Height:	2.2
Material:	4	Cast-in-place Concrete				Count:	1
Element Type:						Total Quantity:	4 sq.m
Environment:		Moderate				Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	sq.m	0	4	0	0

Comments:

Recommended Work: Rehab ☐ Replace ☐ Maintenance Needs:

Timing: Urgent ☐ < 1yr ☐ 1 - 5 yr ☐ 6 - 10 yr ☐ ☐ Urgent ☐ 1 year ☐ 2 year

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Element Data

Element Group:	1200	Culverts				Length:	5.5
Element Name:	1202	Outlet Components				Width:	0.4
Location:						Height:	2.2
Material:	4	Cast-in-place Concrete				Count:	1
Element Type:						Total Quantity:	4 sq.m
Environment:		Moderate				Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	sq.m	0	4	0	0

Comments:

Recommended Work: Rehab ☐ Replace ☐ Maintenance Needs:

Timing: Urgent ☐ < 1yr ☐ 1 - 5 yr ☐ 6 - 10 yr ☐ ☐ Urgent ☐ 1 year ☐ 2 year

Element Group:	1400	Embankments & Streams				Length:	
Element Name:	1402	Embankments				Width:	
Location:						Height:	
Material:						Count:	1
Element Type:						Total Quantity:	1 All
Environment:						Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	All	0	1	0	0

Comments:
Grassed waterway. Erosion starting at all quadrants.

Recommended Work: Rehab ☐ Replace ☐ Maintenance Needs: Erosion Control at Bridges

Timing: Urgent ☐ < 1yr ☐ 1 - 5 yr ☐ 6 - 10 yr ☐ ☐ Urgent ☐ 1 year ☒ 2 year

Element Group:	1300	Foundations				Length:	
Element Name:	1301	Foundation (below ground level)				Width:	
Location:						Height:	
Material:	4	Cast-in-place Concrete				Count:	1
Element Type:						Total Quantity:	1 All
Environment:						Limited Inspection:	X
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	All				

Comments:
Limited inspection due to water level.

Recommended Work: Rehab ☐ Replace ☐ Maintenance Needs:

Timing: Urgent ☐ < 1yr ☐ 1 - 5 yr ☐ 6 - 10 yr ☐ ☐ Urgent ☐ 1 year ☐ 2 year

Figure 1 North Approach

Figure 2 South Approach

Figure 3 East Profile

Figure 4 West Profile

Figure 5 Upstream

Figure 6 Downstream

Figure 7 Barrel

Figure 8 Honeycombing at North Wall

Figure 9 Narrow Crack and Staining at North Wall

Figure 10 Narrow Crack and Staining at South Wall

Figure 11 Leakage at Joints

Figure 12 Typical Deterioration at Drains

Figure 13 Wearing Surface, Note Transverse Crack