FERTILIZER ROAD CULVERT

Site Number 002501-N

FERTILIZER ROAD, WINDHAM

0.3 km N of Windham Road 14

Ontario Structure Inspection Manual - Inspection Form **Site Number:** 002501-N

Inventory Data:

Structure Name	Fertilizer Road Culvert						
Main Hwy/Road #	FERTILIZER RD	[X] On [ ] Under	Crossing Type:	[ ] Rail [ ] Ped.	[ ] Road [ ] Other	[ ] Navig. Water [X] Non-Navig. Water	
Hwy/Road Name	FERTILIZER ROAD, WINDHAM						
Structure Location	0.3 km N of Windham Road 14						
Latitude			Longitude				
Owner(s)	Norfolk County		Heritage Designation:	[X] Not Cons. [ ] Cons./not App.	[ ] List/not Design. [ ] Desig./not List	[ ] Desig. & 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	1390	% Trucks		
Geographic Twp.	124 Windham		Inspection Route Sequence				
Structure Type	15 Rigid Frame, Vertical Legs		Interchange Number				
Total Deck Length	3.9 (m)		Interchange Structure Number				
Overall Str. Width	21 (m)		Min. Vertical Clearance	2.1 (m)			
Total Deck Area	81.9 (m^2)		Special Route	[ ] Truck	[ ] Emergency	[X] School	[ ] Bicycle
Roadway Width	12 (m)		Detour Length Around Bridge	9.8 (km)			
Skew Angle	(Degrees)		Direction of Structure	East / West			
No. of Spans	1		Fill on Structure	1.5 (m)			
Span Length	3.3 (m)						

Historical Data:

Year Built	1960	Year of Last Major Rehab.	
Last OSIM Inspection	July 6, 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 21, 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:	31 ^{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:
Monitor walls / cracks on a regular basis. Structure condition worsening from previous inspection. Recommend replacement. Gas on West (buried) pipe across creek bottom at East end.

Overall Structure Notes:			
Recommended Work on Structure:	[ ] None	[ ] Minor Rehab.	[X] Replace
	[ ] Maintenance	[ ] Major Rehab.	
Timing of Recommended Work:	[X] 1 to 5 years	[ ] 6 to 10 years	
Overall Comments:	Monitor structure walls on a regular basis. Recommend replacement.		
Date of next Inspection:	July 21, 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	
X		Barrels			**X**		
X		Inlet Components			**X**		
X		Outlet Components		**X**			
		Wearing Surface					
	X	Culvert					$400,000
						Total Cost	$400,000

Associated Work:	Comments	Estimated Construction Cost
Additional Investigations	Geotechnical	$7,500
Traffic Management	Detour	$10,000
Utilities	Allowance	$7,500
Road Allowance		
Environmental Assessment		
Engineering		$45,000
Other		
Contingencies		$10,000
	Total Cost	$80,000

Justification:

Notes:

Construction Cost:	$400,000
Associated Work Cost:	$80,000
TOTAL Estimated Cost:	$480,000

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Element Data

Element Group:	1200	Culverts				Length:	3
Element Name:	1203	Barrels				Width:	3.9
Location:		West Side				Height:	
Material:	4	Cast-in-place Concrete				Count:	1
Element Type:						Total Quantity:	11.7 sq.m
Environment:		Moderate				Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	sq.m	0	0	0	11.7

Comments:
Severe deterioration, reinforcement exposed at West end. Cracking and spalling/delamination on localized areas of East end.

Recommended Work: Rehab [X] Replace [ ]
Timing: Urgent [ ] < 1yr [ ] 1 - 5 yr [X] 6 - 10 yr [ ]
Maintenance Needs: [ ] Urgent [ ] 1 year [ ] 2 year

Element Group:	1200	Culverts				Length:	3.9
Element Name:	1201	Inlet Components				Width:	0.3
Location:		East				Height:	2.1
Material:	4	Cast-in-place Concrete				Count:	1
Element Type:						Total Quantity:	2.4 sq.m
Environment:		Moderate				Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	sq.m	0	0	1.48	1.0

Comments:
Deterioration - including efflorescence on Northeast wingwalls and Southeast (spall) wingwall.

Recommended Work: Rehab [X] Replace [ ]
Timing: Urgent [ ] < 1yr [ ] 1 - 5 yr [X] 6 - 10 yr [ ]
Maintenance Needs: [ ] Urgent [ ] 1 year [ ] 2 year

Element Group:	1200	Culverts				Length:	3.9
Element Name:	1202	Outlet Components				Width:	0.3
Location:		West				Height:	2.1
Material:	4	Cast-in-place Concrete				Count:	1
Element Type:						Total Quantity:	2.4 sq.m
Environment:		Moderate				Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	sq.m	0	0	0	2.4

Comments:
Inside wall on northwest appears to be buckling. Severe delamination and continuous deterioration.

Recommended Work: Rehab [X] Replace [ ]
Timing: Urgent [ ] < 1yr [X] 1 - 5 yr [ ] 6 - 10 yr [ ]
Maintenance Needs: [ ] Urgent [ ] 1 year [ ] 2 year

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Element Data

Element Group:	100	Decks	Length:	
Element Name:	101	Wearing Surface	Width:	
Location:		Top of Deck	Height:	
Material:	2	Asphalt	Count:	1
Element Type:			Total Quantity:	1 Each
Environment:		Severe	Limited Inspection:	
Protection System:		Unknown	Perform. Deficiencies	

Condition Data:	Units	Exc.	Good	Fair	Poor
	Each	0	0.85	0	0.15

Comments:
Cracking along centerline of culvert and cracking at structure edges.

Recommended Work: Rehab ☐ Replace ☐	Maintenance Needs: Rout and Seal
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 Cracking and Efflorescence at East End of Barrel

Figure 9 Cracks and Deterioration at Drains

Figure 10 Delamination, Cracking at West End of Barrel

Figure 11 Honeycombing at Center of Barrel

Figure 12 Minor Scaling at Top of Inlet

Figure 13 Severe Deterioration at NW Corner

Figure 14 Severe Deterioration at West End

Figure 15 Severe Spalling at Outlet

Figure 16 Wearing Surface, Note Transverse Cracks at Edge of Structure