

**COUNTY ROAD 28 CULVERT**

Site Number 972802

**NORFOLK COUNTY ROAD 28, HOUGHTON**

4.8 km N of County Road 42

**Ontario Structure Inspection Manual - Inspection Form**

**Site Number:**

Inventory Data:			
Structure Name	<input type="text" value="County Road 28 Culvert"/>		
Main Hwy/Road #	<input type="text" value="NORFOLK COUNTY RD 28"/>	<input checked="" type="checkbox"/> On <input type="checkbox"/> Under	Crossing Type: <input type="checkbox"/> Rail <input type="checkbox"/> Road <input type="checkbox"/> Navig. Water <input type="checkbox"/> Ped. <input type="checkbox"/> Other <input checked="" type="checkbox"/> Non-Navig. Water
Hwy/Road Name	<input type="text" value="NORFOLK COUNTY ROAD 28, HOUGHTON"/>		
Structure Location	<input type="text" value="4.8 km N of County Road 42"/>		
Latitude	<input n"="" type="text" value="42d 38' 05.8"/>	Longitude	<input type="text" value="80d 39' 35.6" w"=""/>
Owner(s)	<input type="text" value="Norfolk County"/>	Heritage Designation:	<input checked="" type="checkbox"/> Not Cons. <input type="checkbox"/> Cons./not App. <input type="checkbox"/> List/not Design. <input type="checkbox"/> Design./not List <input type="checkbox"/> Desig. & List
MTO Region	<input type="text" value="30"/> Southwestern	Road Class:	<input type="checkbox"/> Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input checked="" type="checkbox"/> Local
MTO District	<input type="text" value="31"/> London / Stratford	Posted Speed	<input type="text" value="80"/> No. of Lanes <input type="text" value="2"/>
Old County	<input type="text" value="20"/> Norfolk	AADT	<input type="text" value="300"/> % Trucks <input type="text"/>
Geographic Twp.	<input type="text" value="1126"/> Houghton	Inspection Route Sequence	<input type="text"/>
Structure Type	<input type="text" value="11"/> Ellipse Culvert	Interchange Number	<input type="text"/>
Total Deck Length	<input type="text" value="3.96"/> (m)	Interchange Structure Number	<input type="text"/>
Overall Str. Width	<input type="text" value="8.2"/> (m)	Min. Vertical Clearance	<input type="text" value="4.8"/> (m)
Total Deck Area	<input type="text" value="32.472"/> (m <sup>2</sup> )	Special Route	<input type="checkbox"/> Truck <input type="checkbox"/> Emergency <input checked="" type="checkbox"/> School <input type="checkbox"/> Bicycle
Roadway Width	<input type="text"/> (m)	Detour Length Around Bridge	<input type="text" value="11"/> (km)
Skew Angle	<input type="text" value="25"/> (Degrees)	Direction of Structure	<input type="text" value="East / West"/>
No. of Spans	<input type="text" value="2"/>	Fill on Structure	<input type="text" value="1.1"/> (m)
Span Length	<input type="text" value="4.1"/> (m)		

Historical Data:			
Year Built	<input type="text" value="1973"/>	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	<input type="text" value="June 18, 2014"/>	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text" value="/ /"/> (tonnes)
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		
Rehab History:	(Date/description)		

**Ontario Structure Inspection Manual - Inspection Form**

**Site Number:** 972802

Field Inspection Information:		
Date of Inspection:	July 12, 2016	Type of Inspection: <input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Matt Alderson, G. Douglas Vallee Ltd.	
Others in Party:	N/A	
Access Equipment Used:	Hammer, Binoculars, Measuring Tape, Camera, etc.	
Weather:	Sunny	
Temperature:	24 °C	

Additional Investigation Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
<input checked="" type="checkbox"/> Detailed Deck Condition Survey:	X		
<input checked="" type="checkbox"/> Non-destructive Delamination Survey of Asphalt-Covered Deck:	X		
<input checked="" type="checkbox"/> Concrete Substructure Condition Survey:	X		
<input checked="" type="checkbox"/> Detailed Coating Condition Survey:	X		
<input checked="" type="checkbox"/> Detailed Timber Investigation	X		
<input checked="" type="checkbox"/> Post-Tensioned Strand Investigation	X		
Underwater Investigation:	X		
Fatigue Investigation:	X		
Seismic Investigation:	X		
Structure Evaluation:	X		
Monitoring			
<input checked="" type="checkbox"/> Monitoring of Deformations, Settlements and Movements:	X		
<input checked="" type="checkbox"/> Monitoring Crack Widths:	X		
Investigation Notes:			
Outlet - Bridge Cleaning, Wearing Surface - Rout and Seal			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	
Date of next Inspection:	July 12, 2018

**Suspected Performance Deficiencies**

- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"> <li>01 Load carrying capacity</li> <li>02 Excessive deformations (deflections &amp; rotations)</li> <li>03 Continuing settlement</li> <li>04 Continuing movements</li> <li>05 Seized bearings</li> </ul> | <ul style="list-style-type: none"> <li>07 Bearing not uniformly loaded/unstable</li> <li>08 Jammed expansion joint</li> <li>09 Pedestrian/vehicular hazard</li> <li>10 Rough riding surface</li> <li>11 Deck drainage</li> </ul> | <ul style="list-style-type: none"> <li>12 Slippery surfaces</li> <li>13 Flooding/channel blockage</li> <li>14 Undermining of foundation</li> <li>15 Unstable embankments</li> <li>16 Other</li> </ul> |
|---|--|---|

**Maintenance Needs**

- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"> <li>01 Lift and swing bridge maintenance</li> <li>02 Bridge cleaning</li> <li>03 Bridge handrail maintenance</li> <li>04 Painting steel bridge structures</li> <li>05 Bridge deck joint repair</li> <li>06 Bridge bearing maintenance</li> </ul> | <ul style="list-style-type: none"> <li>07 Repair to structural steel</li> <li>08 Repair of bridge concrete</li> <li>09 Repair of bridge timber</li> <li>10 Bailey bridges - maintenance</li> <li>11 Animal/pest control</li> <li>12 Bridge surface repair</li> </ul> | <ul style="list-style-type: none"> <li>13 Erosion control at bridges</li> <li>14 Concrete sealing</li> <li>15 Rout and seal</li> <li>16 Bridge deck drainage</li> <li>17 Scaling (Loose concrete or ACR steel)</li> <li>18 Other</li> </ul> |
|---|--|---|

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Site Number: 972802

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					
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 <hr/> 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 Each
Environment:		Severe				Limited Inspection:		
Protection System:		Unknown				Perform. Deficiencies		
Condition	Units	Exc.	Good	Fair	Poor			
Data:	Each	0	0	1	0			
Comments:								
Cracking in surface. Drainage is in open ditches. Slopes are stable.								
Recommended Work:				Rehab <input type="checkbox"/>		Replace <input type="checkbox"/>		
Timing:				Urgent <input type="checkbox"/>		< 1yr <input type="checkbox"/>		
				1 - 5 yr <input type="checkbox"/>		6 - 10 yr <input type="checkbox"/>		
Maintenance Needs:				Rout and Seal				
				<input type="checkbox"/> Urgent		<input type="checkbox"/> 1 year		
						<input checked="" type="checkbox"/> 2 year		

Element Group:		1200 Culverts				Length:		24.6
Element Name:		1203 Barrels				Width:		3.3
Location:		Inside				Height:		2
Material:		5 Corrugated Steel				Count:		1
Element Type:		Pipe Arch				Total Quantity:		179.6 sq.m
Environment:		Benign				Limited Inspection:		
Protection System:		Unknown				Perform. Deficiencies		
Condition	Units	Exc.	Good	Fair	Poor			
Data:	sq.m	0	179.6	0	0			
Comments:								
Banks are stable. Minor corrosion at plates near waterline. Buildup of streambed material along culvert edge.								
Recommended Work:				Rehab <input type="checkbox"/>		Replace <input type="checkbox"/>		
Timing:				Urgent <input type="checkbox"/>		< 1yr <input type="checkbox"/>		
				1 - 5 yr <input type="checkbox"/>		6 - 10 yr <input type="checkbox"/>		
Maintenance Needs:								
				<input type="checkbox"/> Urgent		<input type="checkbox"/> 1 year		
						<input type="checkbox"/> 2 year		

Element Group:		1200 Culverts				Length:		3.3
Element Name:		1201 Inlet Components				Width:		
Location:		West End				Height:		2
Material:		5 Corrugated Steel				Count:		1
Element Type:						Total Quantity:		1 Each
Environment:		Moderate				Limited Inspection:		
Protection System:		Unknown				Perform. Deficiencies		
Condition	Units	Exc.	Good	Fair	Poor			
Data:	Each	0	1	0	0			
Comments:								
Recommended Work:				Rehab <input type="checkbox"/>		Replace <input type="checkbox"/>		
Timing:				Urgent <input type="checkbox"/>		< 1yr <input type="checkbox"/>		
				1 - 5 yr <input type="checkbox"/>		6 - 10 yr <input type="checkbox"/>		
Maintenance Needs:								
				<input type="checkbox"/> Urgent		<input type="checkbox"/> 1 year		
						<input type="checkbox"/> 2 year		

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**Element Data**

Element Group:	1200 Culverts	Length:	3.3			
Element Name:	1202 Outlet Components	Width:				
Location:	East End	Height:	2			
Material:	5 Corrugated Steel	Count:	1			
Element Type:		Total Quantity:	1 Each			
Environment:	Moderate	Limited Inspection:				
Protection System:	Unknown	Perform. Deficiencies				
Condition Data:	Units	Exc.	Good	Fair	Poor	Flooding/channel blockage
	Each	0	0	1	0	
Comments: Tree debris blocking stream at outlet.						
Recommended Work:    Rehab <input type="checkbox"/> Replace <input type="checkbox"/>			Maintenance Needs:    Other - Debris Removal			
Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input type="checkbox"/> 6 - 10 yr <input type="checkbox"/>			<input type="checkbox"/> Urgent <input checked="" type="checkbox"/> 1 year <input type="checkbox"/> 2 year			



Figure 1 North Approach



Figure 2 South Approach



Figure 3 East Profile, Outlet



Figure 4 West Profile, Inlet





Figure 5 Upstream



Figure 6 Downstream



Figure 7 Barrel, Looking East



Figure 8 Barrel, Looking West



Figure 9 West Culvert Top



Figure 10 Corrosion at Waterline



Figure 11      Cracking on Wearing Surface