

**BLACK CREEK CULVERT**

Site Number 030048

**CONCESSION 12 ROAD, TOWNSEND**

0.8 km W of County Road 5

**Ontario Structure Inspection Manual - Inspection Form**

**Site Number:**

Inventory Data:			
Structure Name <input type="text" value="Black Creek Culvert"/>			
Main Hwy/Road # <input type="text" value="CON 12 TOWNSEND"/>	<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="CONCESSION 12, TOWNSEND"/>			
Structure Location <input type="text" value="0.8km W of County Road 5"/>			
Latitude <input n"="" type="text" value="42d 53' 36.4"/>	Longitude <input type="text" value="80d 14' 36.8" 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"/> <input type="text" value="Southwestern"/>	Road Class: <input type="checkbox"/> Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local		
MTO District <input type="text" value="31"/> <input type="text" value="London / Stratford"/>	Posted Speed <input type="text" value="80"/>	No. of Lanes <input type="text" value="2"/>	
Old County <input type="text" value="20"/> <input type="text" value="Norfolk"/>	AADT <input type="text" value="152"/>	% Trucks <input type="text"/>	
Geographic Twp. <input type="text" value="125"/> <input type="text" value="Townsend"/>	Inspection Route Sequence <input type="text"/>		
Structure Type <input type="text" value="15"/> <input type="text" value="Rigid Frame, Vertical Legs"/>	Interchange Number <input type="text"/>		
Total Deck Length <input type="text" value="4.2"/> (m)	Interchange Structure Number <input type="text"/>		
Overall Str. Width <input type="text" value="18.6"/> (m)	Min. Vertical Clearance <input type="text" value="1.8"/> (m)		
Total Deck Area <input type="text" value="78.1"/> (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" value="7"/> (m)	Detour Length Around Bridge <input type="text" value="10"/> (km)		
Skew Angle <input type="text"/> (Degrees)	Direction of Structure <input type="text" value="North / South"/>		
No. of Spans <input type="text" value="1"/>	Fill on Structure <input type="text" value="1.6"/> (m)		
Span Length <input type="text" value="3.6"/> (m)			

Historical Data:			
Year Built <input type="text" value="1970"/>	Year of Last Major Rehab. <input type="text"/>		
Last OSIM Inspection <input type="text" value="June 9, 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)			

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**Site Number:**

Field Inspection Information:		
Date of Inspection:	July 6, 2016	Type of Inspection: <input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Ben Buchwald M.Eng., EIT, G. Douglas Vallee Ltd.	
Others in Party:	N/A	
Access Equipment Used:	Hammer, Binoculars, Measuring Tape, Camera, etc.	
Weather:	Sunny	
Temperature:	32 °C	

Additional Investigation Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
<input checked="" type="checkbox"/> Detailed Deck Condition Survey:		<b>X</b>	
<input checked="" type="checkbox"/> Non-destructive Delamination Survey of Asphalt-Covered Deck:	<b>X</b>		
<input checked="" type="checkbox"/> Concrete Substructure Condition Survey:	<b>X</b>		
<input checked="" type="checkbox"/> Detailed Coating Condition Survey:	<b>X</b>		
<input checked="" type="checkbox"/> Detailed Timber Investigation	<b>X</b>		
<input checked="" type="checkbox"/> Post-Tensioned Strand Investigation	<b>X</b>		
Underwater Investigation:	<b>X</b>		
Fatigue Investigation:	<b>X</b>		
Seismic Investigation:	<b>X</b>		
Structure Evaluation:	<b>X</b>		
Monitoring			
<input checked="" type="checkbox"/> Monitoring of Deformations, Settlements and Movements:	<b>X</b>		
<input checked="" type="checkbox"/> Monitoring Crack Widths:	<b>X</b>		
Investigation Notes:	No hazard signs or barriers.		

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 1, 2018		

**Suspected Performance Deficiencies**

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

**Maintenance Needs**

- |                                             |                                        |                                                 |
|---------------------------------------------|----------------------------------------|-------------------------------------------------|
| <b>01</b> Lift and swing bridge maintenance | <b>07</b> Repair to structural steel   | <b>13</b> Erosion control at bridges            |
| <b>02</b> Bridge cleaning                   | <b>08</b> Repair of bridge concrete    | <b>14</b> Concrete sealing                      |
| <b>03</b> Bridge handrail maintenance       | <b>09</b> Repair of bridge timber      | <b>15</b> Rout and seal                         |
| <b>04</b> Painting steel bridge structures  | <b>10</b> Bailey bridges - maintenance | <b>16</b> Bridge deck drainage                  |
| <b>05</b> Bridge deck joint repair          | <b>11</b> Animal/pest control          | <b>17</b> Scaling (Loose concrete or ACR steel) |
| <b>06</b> Bridge bearing maintenance        | <b>12</b> Bridge surface repair        | <b>18</b> 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					
		Streams and Waterways					
		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 <hr style="width: 100px; margin: 0 auto;"/> 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	1	0	0			
Comments:								
No signs, No barrier. Has no slope protection.								
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"/>		
				<input type="checkbox"/>		1 year <input type="checkbox"/>		
				<input type="checkbox"/>		2 year <input type="checkbox"/>		

Element Group:		1200 Culverts				Length:		18.6
Element Name:		1203 Barrels				Width:		6.6
Location:		Interior				Height:		
Material:		4 Cast-in-place Concrete				Count:		1
Element Type:		Frames- Rigid				Total Quantity:		122.8 sq.m
Environment:		Moderate				Limited Inspection:		
Protection System:		Unknown				Perform. Deficiencies		
Condition	Units	Exc.	Good	Fair	Poor			
Data:	sq.m	0	122.8	0	0			
Comments:								
Top of deck only visible from 0.30m at north end. Scaling inside and cracking at localized areas on east and west walls, leaking.								
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"/>		
				<input type="checkbox"/>		1 year <input type="checkbox"/>		
				<input type="checkbox"/>		2 year <input checked="" type="checkbox"/>		

Element Group:		1200 Culverts				Length:		3.6
Element Name:		1201 Inlet Components				Width:		0.3
Location:		North End				Height:		1.8
Material:		4 Cast-in-place Concrete				Count:		1
Element Type:						Total Quantity:		2.2 sq.m
Environment:		Moderate				Limited Inspection:		
Protection System:		Unknown				Perform. Deficiencies		
Condition	Units	Exc.	Good	Fair	Poor			
Data:	sq.m	0	1.1	1.1	0			
Comments:								
Scaling on top of barrel								
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"/>		
				<input type="checkbox"/>		1 year <input type="checkbox"/>		
				<input type="checkbox"/>		2 year <input type="checkbox"/>		

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**Element Data**

Element Group:		1200 Culverts				Length:	3.6
Element Name:		1202 Outlet Components				Width:	0.3
Location:		South End				Height:	1.8
Material:		4 Cast-in-place Concrete				Count:	1
Element Type:						Total Quantity:	2.2 sq.m
Environment:		Moderate				Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	
Condition Data:	Units	Exc.	Good	Fair	Poor		
	sq.m	0	1.1	1.1	0		
Comments: Scaling on top of barrel. Gas line across south face corroded. Repair gas line.							
Recommended Work:    Rehab <input type="checkbox"/> Replace <input type="checkbox"/>					Maintenance Needs:		
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 type="checkbox"/> 1 year <input type="checkbox"/> 2 year		

Element Group:		1400 Embankments & Streams				Length:	
Element Name:		1401 Streams and Waterways				Width:	
Location:						Height:	
Material:						Count:	1
Element Type:						Total Quantity:	1 Each
Environment:						Limited Inspection:	
Protection System:		Unknown				Perform. Deficiencies	
Condition Data:	Units	Exc.	Good	Fair	Poor		
	Each	0	1	0	0		
Comments: Minor erosion at banks.							
Recommended Work:    Rehab <input type="checkbox"/> Replace <input type="checkbox"/>					Maintenance Needs:		
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 type="checkbox"/> 1 year <input type="checkbox"/> 2 year		

Element Group:		1300 Foundations				Length:	18.6
Element Name:		1301 Foundation (below ground level)				Width:	
Location:		Below Ground Level				Height:	
Material:		4 Cast-in-place Concrete				Count:	2
Element Type:						Total Quantity:	37.2
Environment:		Benign				Limited Inspection:	<b>X</b>
Protection System:		Unknown				Perform. Deficiencies	
Condition Data:	Units	Exc.	Good	Fair	Poor		
Comments: Not visible.							
Recommended Work:    Rehab <input type="checkbox"/> Replace <input type="checkbox"/>					Maintenance Needs:		
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 type="checkbox"/> 1 year <input type="checkbox"/> 2 year		



Figure 1 East Approach



Figure 2 West Approach



Figure 3 North Profile, Inlet



Figure 4 South Profile, Outlet





Figure 5 Upstream



Figure 6 Downstream



Figure 7 Barrel



Figure 8 Minor Erosion at Northwest Quadrant



Figure 9 Typical Scaling and Leakage on Culvert Walls



Figure 10 Typical Scaling and Spalling on Culvert Walls