



December 2, 2016

Reference No. 11116995

Mark Smuck
Director of Public Works
Township of North Dumfries
2958 Greenfield Road
P.O. Box 1060
Ayr, ON
N0B 1E0

Dear Mr. Smuck:

Re: 2016 OSIM Inspections for Municipal Bridges and Culverts Larger Than 3 Metres

GHD is pleased to submit this report with the respect to the results of the 2016 Municipal Structure Inventory and Inspection which outlines the results of our field inspection investigations for the above noted project.

This study was completed for the structure inspections using GHD's Microsoft Access Database Municipal Structures and Inventory Assessment (BMS) Software. Structures were reviewed in accordance with the Ontario Structure Inspection Manual (Revised Nov 2003, April 2008).

With this report, all structure related data for those structures inspected in 2016 have been updated to present day values and the content of the report reflects conditions as of the time of the field data collection, in the fall of 2016 for the structure inventory.

We trust that this report will be beneficial to the Township of North Dumfries in developing their asset management plans and wish to express appreciation for the opportunity for GHD to participate in the work.

1.1 Description of Project

The Township of North Dumfries 2016 Municipal Structure Inventory and Inspection Study provides a summary of structure condition ratings identified during rating surveys conducted by GHD in 2016. All of the Township of North Dumfries structures of 3.0 m span or greater were reviewed in 2016. The Township of North Dumfries total inventory of four (4) bridges are included in this report.

Data collection and structure ratings were completed in accordance with the Ontario Structure Inspection Manual. The scope of the report includes summaries of collected data, with discussion and analysis regarding same.

Key items contained within the inspection report are summarized below:

Footbridge Road Bridge

The existing Footbridge Road Bridge located on Footbridge Road is a three (3) span (36.8 m+/-, 36.8 m+/-, 48.9 m +/-) structural steel girder bridge with a cast-in-place concrete deck and an asphalt wearing surface. The bridge overall is in fair to generally good condition with deterioration of various elements and a BCI value of **68.21**. The OSIM report contains recommendations for rehabilitation of the bridge at an estimated



cost of **\$2,633,000**. The bridge has been identified for further engineering investigations (Fatigue Inspection) at an approximate cost of **\$30,000**.

Based on our detailed visual OSIM inspection it is recommended that the following works be completed to the bridge:

- Overlay, patch, waterproof and pave the bridge deck.
- Replace approach wearing surfaces.
- Convert expansion joints to semi-integral.
- Replace parapet wall & railings.
- Remove curbs and construct one sidewalk on bridge deck.
- Replace broken deck drains.
- Replace approach curb and gutter.
- Replace approach guide rail.
- Concrete patch repairs to ballast walls, wingwalls and haunch.
- Consideration should be given to adding a sidewalk for pedestrian traffic on the approaches.

Jedburgh Dam Bridge

The existing Jedburgh Bridge located on Main Street is a two (2) span (4.9 m+/-, 1.7 m +/-) concrete solid slab bridge with a cast-in-place concrete deck and an asphalt wearing surface. The bridge overall is in poor to fair condition with deterioration of various elements and a BCI value of **49.91**. The OSIM report contains recommendations for rehabilitation of the bridge at an estimated cost of **\$224,000**. The bridge has been identified for further engineering investigations (Detailed Deck Condition Survey and Concrete Substructure Condition Survey) at an approximate cost of **\$15,000**. The bridge has an existing load limit posting of 10 tonnes, the existing load limit posting can be retained.

Based on our detailed visual OSIM inspection it is recommended that the following works be completed to the bridge:

- Rout and seal cracks on approach wearing surface and deck wearing surface.
- Replace approach guide rail and provide guide rail continuous over the bridge.
- Concrete patch repairs to abutments, wingwalls, curbs, piers and soffit.

The report also contains recommended the following maintenance works:

- Replace existing load limit posting sign with legal signage.
- Patch repair potholes in deck wearing surface.

Piper Street Bridge

The existing Piper Street Bridge located on Piper Street is a three (3) span (20.1 m+/-, 19.8 m+/-, 20.1 m+/-) pre-cast concrete box beam girder bridge with a reinforced cast-in-place concrete deck and an asphalt wearing surface. The bridge overall is in fair to generally good condition with deterioration of various elements and a BCI value of **67.87**. The OSIM report contains recommendations for rehabilitation of the bridge at an estimated cost of **\$348,000**. The bridge has been identified for further engineering investigations (Detailed Deck Condition Survey) at an approximate cost of **\$15,000**.



Based on our detailed visual OSIM inspection it is recommended that the following works be completed to the bridge:

- Replace utility conduit in curb.
- Replace joint seals at abutments and over piers.
- Rout and seal cracks in asphalt.
- Concrete patch repairs to girders, exterior soffit, piers and sidewalk.
- Replace / upgrade guide rail

The report also contains recommended the following maintenance works:

- Replace junction box cover plates.
- Reposition / secure handrail and replace deteriorated barrier panels.

Shellard Road Bridge

The existing Shellard Road Bridge located on Shellard Sideroad (Sideroad 17) is a single span (7.3 m+/-) steel girder bridge with a cast-in-place concrete deck and an concrete wearing surface. The bridge overall is in good to excellent condition with deterioration of various elements and a BCI value of **82.43**. The OSIM report contains recommendations for rehabilitation of the bridge at an estimated cost of **\$32,000**.

Based on our detailed visual OSIM inspection it is recommended that the following works be completed to the bridge:

- Seal cracks in concrete deck top.
- Repair broken section of expansion joint armouring angle.
- Patch repair abutment.

The report also contains recommended the following maintenance works:

- Clean deck top.
- Replace missing bolts from hand railing
- Patch potholes and pad approach wearing surface
- Replace damaged section of steel flex beam guide rail.



1.2 Conclusion

The Footbridge Road Bridge, Jedburgh Dam Bridge and the Piper Street Bridge have been recommended for further engineering investigations to confirm visual repair recommendations as summarized above at a total cost of **\$60,000**. It is recommended that engineering investigations be completed within 2 to 4 years prior to structure rehabilitations.

It is recommended that the structures be re-inspected by a qualified structure engineer every two (2) years. We trust that the foregoing is satisfactory. Please contact the undersigned if you have any questions in the above regard or if we can be of any further assistance.

Sincerely,

GHD

Dennis Baxter, P. Eng.
Senior Manager, Bridges
Associate
dennis.baxter@ghd.com



DLB/JREP

Encl.

Sincerely,

GHD

David M. Gagné
Senior Manager, Bridge Inspections
Associate
david.gagne@ghd.com

Repair Rehabilitation Summary

Township of North Dumfries

Element Group	Element	Repair/Rehabilitation Required	Priority	Cost	Comments
Bridges					
Jedburgh Dam Br		BCI 49.91	SPN 35.04	<i>Inspected on: 12-Oct-16</i>	
Jedburgh Dam Bridge				SPN 35.04	BCI: 49.91
Decks	> Soffit - Thick Slab Interior	Rehab	1-5 yrs	10,000	Concrete patches
Abutments	> Abutment Walls	Rehab	1-5 yrs	20,000	Patch repairs
Abutments	> Wingwalls	Rehab	1-5 yrs	5,000	Patch repair
Approaches	> Approach Guiderail	Rehab	1-5 yrs	70,000	Replace guiderail and end treatments
Piers	> Shafts/Columns/Pile Bents	Rehab	1-5 yrs	10,000	Patch repairs and crack injections
Barriers	> Railing Systems	Rehab	1-5 yrs	4,000	Replace continuous with approach guiderail
Decks	> Soffit - Thick Slab Exterior	Rehab	1-5 yrs	5,000	Patch repairs
Decks	> Wearing Surface	Rehab	1-5 yrs	5,000	Seal cracks
Approaches	> Wearing Surface	Rehab	1-5 yrs	5,000	Rout and seal cracks
Sidewalks/curb	> Curbs	Rehab	1-5 yrs	5,000	Concrete patch repair
Total Repair/Rehabilitation Cost				139,000	
Total Cost of Associated Work				85,000	
Total Cost				<u>224,000</u>	
Township of North Dumfries Share @ 100%				224,000	

Element Group	Element	Repair/Rehabilitation Required	Priority	Cost	Comments
Piper Street Bridg		BCI 67.87	SPN 41.06	<i>Inspected on: 12-Oct-16</i>	
Piper Street Bridge				SPN 41.06	BCI: 67.87
Sidewalks/curb	> Sidewalks/Medians	Rehab	1-5 yrs	10,000	Repair sidewalk
Piers	> Shafts/Columns/Pile Bents	Rehab	1-5 yrs	10,000	Patch repair
Joints	> Seals/Sealants	Replace	1-5 yrs	41,000	Replace joint seals
Beams/MLE's	> Girders End	Rehab	1-5 yrs	30,000	Patch repairs and seal wide crack
Sidewalks/curb	> Curbs	Rehab	1-5 yrs	5,000	Patch repairs
Beams/MLE's	> Girders Middle	Rehab	1-5 yrs	5,000	Patch repairs
Accessories	> Utilities Conduit	Rehab	1-5 yrs	5,000	Replace corroded section of conduit
Approaches	> Wearing Surface	Rehab	1-5 yrs	5,000	Rout and seal cracks
Barriers	> Posts	Rehab	1-5 yrs	70,000	Should replace/upgrade approach guiderail
Decks	> Wearing Surface	Rehab	1-5 yrs	5,000	Seal cracks
Decks	> Soffit - Thick Slab Exterior	Rehab	1-5 yrs	5,000	Concrete patch repair
Joints	> Seals/Sealants	Replace	1-5 yrs	41,000	Replace joint seals
Total Repair/Rehabilitation Cost				232,000	
Total Cost of Associated Work				116,000	
Total Cost				<u>348,000</u>	
Township of North Dumfries Share @ 100%				348,000	

Element Group	Element	Repair/Rehabilitation Required	Priority	Cost	Comments
Footbridge Rd Bri		BCI 68.21	SPN 42.90	<i>Inspected on: 12-Oct-16</i>	
Footbridge Road Bridge				SPN 42.9	BCI: 68.21
Approaches	> Approach Guiderail Terminal	Replace		0	Costed under Approach Guide Rail
Abutments	> Wingwalls	Rehab	1-5 yrs	3,000	Patch repairs
Barriers	> Barrier/Parapet Walls Interior	Replace	1-5 yrs	420,000	Replace Parapet Walls & Railing
Barriers	> Hand Railings	Replace	1-5 yrs	0	Costed under Barriers Interior
Decks	> Drainage	Rehab	1-5 yrs	5,000	Replace two drains near east pier. Repair leaking drain at northwest.
Decks	> Wearing Surface	Rehab	1-5 yrs	725,000	Overlay, Waterproof & Pave
Joints	> Seals/Sealants	Replace	1-5 yrs	70,000	Replace expansion joints
Sidewalks/curb	> Curbs	Replace	1-5 yrs	250,000	Replace with sidewalk on one side
Joints	> Armouring/Retaining Devices	Replace	1-5 yrs	0	Costed under seals
Decks	> Deck Top	Rehab	1-5 yrs	0	Costed under Deck Wearing Surface
Approaches	> Approach Guiderail	Replace	1-5 yrs	110,000	Replace Guide Rail
Abutments	> Ballast Walls	Rehab	1-5 yrs	0	Replace with semi-integral joints (costed under Joints)
Abutments	> Abutment Walls	Rehab	1-5 yrs	10,000	Patch repair
Barriers	> Barrier/Parapet Walls Exterior	Replace	1-5 yrs	0	Costed under Barriers Interior
Total Repair/Rehabilitation Cost				1,593,000	
Total Cost of Associated Work				1,040,000	
Total Cost				<u>2,633,000</u>	
Township of North Dumfries Share @ 100%				2,633,000	

Element Group	Element	Repair/Rehabilitation Required	Priority	Cost	Comments
Shellard Road Bri		BCI 82.43 SPN 22.78			<i>Inspected on: 12-Oct-16</i>
Shellard Road Bridge (Sideroad 17) over Mill Creek				SPN 22.78 BCI: 82.43	
Decks	> Deck Top	Rehab	1-5 yrs	5,000	Seal cracks
Abutments	> Abutment Walls	Rehab	6-10 yrs	5,000	Patch repair
Joints	> Armouring/Retaining Devices	Rehab	1-5 yrs	5,000	Repair broken section of armouring angle
Total Repair/Rehabilitation Cost				15,000	
Total Cost of Associated Work				17,000	
Total Cost				<u>32,000</u>	
Township of North Dumfries Share @ 100%				32,000	

Maintenance Needs Summary

Township of North Dumfries

Element Group	Element	Maintenance Need	Priority	Comments
Jedburgh Dam Br <i>Jedburgh Dam Bridge</i>				<i>Inspected on: 12-Oct-16</i>
Accessories	> Signs	Other	1 yr	Replace posting sign with legal signage
Decks	> Wearing Surface	Bridge Surface Repair	1 yr	Patch potholes
Piper Street Bridg <i>Piper Street Bridge</i>				<i>Inspected on: 12-Oct-16</i>
Accessories	> Utilities	Other	1 yr	Replace junction box cover plates
Barriers	> Railing Systems	Bridge Handrail Maintenance	1 yr	Replace deteriorated panels
Barriers	> Hand Railings	Bridge Handrail Maintenance	1 yr	Reposition/secure handrail
Shellard Road Bri <i>Shellard Road Bridge (Sideroad 17) over Mill Creek</i>				<i>Inspected on: 12-Oct-16</i>
Approaches	> Approach Guiderail	Bridge Handrail Maintenance	2 yr	Replace damaged section of flex beam
Approaches	> Wearing Surface	Bridge Surface Repair	1 yr	Patch potholes/pad approaches
Barriers	> Hand Railings	Bridge Handrail Maintenance	2 yr	Replace missing bolts
Decks	> Deck Top	Bridge Cleaning	2 yr	Clean deck

Summary Action Report
Structure Footbridge Rd Bridge (MTO Site No. Footbridge Rd Bridge)
Footbridge Road Bridge

Inspection Date 10/12/2016 mm/dd/yyyy

Condition Index Value (BCI) **68.21**

Next Biennial Inspection 10/12/2018 mm/dd/yyyy

Current Rep. Value **\$8,364,265**

Additional Investigations

Investigation	Priority	Cost	Investigation	Priority	Cost
Fatigue Investigation	Normal	\$30,000			
Additional investigations required see page 3 for details.					

Performance Deficiencies

Element Group	Element	Performance Deficiency
Barriers	Posts	Load carrying capacity
Decks	Drainage	Deck drainage

Maintenance Needs

No Maintenance Needs

Repair/Rehabilitation

Element Group	Element		Repair/Rehabilitation	Priority	Cost
Abutments	Abutment Walls		Rehab Patch repair	1-5 yrs	\$10,000
Abutments	Ballast Walls		Rehab Replace with semi-integral joints (costed under Joints)	1-5 yrs	\$0
Approaches	Approach Guiderail	Terminal	Replace Costed under Approach Guide Rail		\$0
Abutments	Wingwalls		Rehab Patch repairs	1-5 yrs	\$3,000
Approaches	Approach Guiderail		Replace Replace Guide Rail	1-5 yrs	\$110,000
Barriers	Barrier/Parapet Walls	Interior	Replace Replace Parapet Walls & Railing	1-5 yrs	\$420,000
Barriers	Hand Railings		Replace Costed under Barriers Interior	1-5 yrs	\$0
Barriers	Barrier/Parapet Walls	Exterior	Replace Costed under Barriers Interior	1-5 yrs	\$0
Decks	Drainage		Rehab Replace two drains near east pier. Repair leaking drain at northwest.	1-5 yrs	\$5,000
Decks	Deck Top		Rehab Costed under Deck Wearing Surface	1-5 yrs	\$0
Decks	Wearing Surface		Rehab Overlay, Waterproof & Pave	1-5 yrs	\$725,000
Joints	Armouring/Retaining Devices		Replace Costed under seals	1-5 yrs	\$0
Joints	Seals/Sealants		Replace Replace expansion joints	1-5 yrs	\$70,000
Sidewalks/curbs	Curbs		Replace Replace with sidewalk on one side	1-5 yrs	\$250,000
Total Repair/Rehabilitation Cost					\$1,593,000

Township of North Dumfries	100 %	\$2,633,000.00	Total Associated Work Cost	\$1,040,000
			Total Cost	\$2,633,000

Overall Comments

Should overlay, patch, waterproof and pave deck based on condition survey report and inspection. HCP for 31.5% of deck area. Consideration should be given to adding a sidewalk on the approaches. Convert expansion joints to semi-integral, replace parapet walls, broken deck drains, approach curb and gutter and guide rail. Concrete patch repairs to ballast walls, wingwalls and haunch. Remove curbs and construct one sidewalk.

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge**

Inventory Data

Structure Name	Footbridge Road Bridge		Hwy No.	Footbrid	Key Photo
Cross. Type Over	<input type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Ped <input checked="" type="checkbox"/> Nav. Water <input type="checkbox"/> Non-Nav. Wat <input type="checkbox"/> Other				
Cross. Type Under	<input checked="" type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Ped <input type="checkbox"/> Nav. Water <input type="checkbox"/> Non-Nav. Wat <input type="checkbox"/> Other				
Road Name	Footbridge Road				
Structure Location	Approximately 50m West of Highway 24				
Latitude	43.31746	Longitude	-80.31415	Cur. Rep. Value	\$8,364,265
Owner(s)/ % Share	Township of North Dumfries		100 %	**	
MTO Region	Southwestern		Road Side Env.	Rural	
MTO District	London/Stratford		Road Class	Local	
Old County	Waterloo		Lane Type	Regular	
Geographic Twp.	North Dumfries		Posted Speed	80	No. of Lanes
Structure Type	I-Beam or Girders		AADT	0	Pct. Trucks
Structure Material	Structural Steel		Inspection Route Sequence		
Articulation	Continuous		Interchange Number		
Total Deck Length	122.5 m	Road Width	8.62	Interchange Structure Number	
Overall Width	10.4 m	Vert. Clear.	0	Detour Length	0 km
Total Deck Area	1274.00 m ²	No. of Spans	3	Fill on Structure	0 m
Special Routes	<input type="checkbox"/> Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle		Insp. Duration	1 hr	Skew Angle
					0°
					Struct. Dir.
					East/West



Spans

** Current Replacement Value is based on in kind replacement of the existing structure and calculated using benchmark costs. Capital planning should consider site specific cost factors and requirements for widening or lengthening of the structure.

Span Name	Span Length	Span Name	Span Length
1	36.8 m	2	48.9 m
3	36.8 m		

Historical Data

Year Built	1970	Year of Last Major Rehab	
Last OSIM Inspection	06/04/2013	Contract No. When Built	
Last Enhanced OSIM		Last Evaluation	
Last Enhanced Access		Current Load Limit	<input type="checkbox"/> t <input type="checkbox"/> t <input type="checkbox"/> t
Last Underwater Insp.		Load Limit By-Law No.	
Last Condition Survey		By-Law Expiry Date	

Rehab History

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge**

Field Inspection Information:

Inspection Date	10/12/2016 mm/dd/yyyy	<input type="checkbox"/> Multi Day Inspection	<input checked="" type="checkbox"/> OSIM	<input type="checkbox"/> Enhanced OSIM	BCI	68.21
Inspector	D. L. Baxter, P. Eng.		Eng. Responsible D. L. Baxter, P. Eng.			
Others in Party	C. Harper		J. Parkinson			
Access Equip.	<input type="checkbox"/> Lift <input type="checkbox"/> Ladder <input type="checkbox"/> Boat <input type="checkbox"/> Bridge Master Other <input type="text"/>					
Other Equip.	Camera, Hammer, Other Hand Tools					
Weather	Sunny		Temperature	20 °C		

Additional Investigations Required:

Investigation	Priority			Estimated Cost
	None	Normal	Urgent	
Detailed Deck Condition Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Delamination Survey of Asphalt-Covered Deck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Concrete Substructure Condition Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Detailed Coating Condition Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Detailed Timber Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Post-Tensioned Strand Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Underwater Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Fatigue Investigation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	\$30,000
Seismic Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Structure Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Monitoring of Deformations, Movements and Settlements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Monitoring of Crack Widths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Investigation Notes				Total Cost \$30,000

Overall Structure Notes:

Recommended Work on Structure ☐ None ☒ Rehab ☐ Replace ☐ Remove

Timing of Recommended Work ☐ None ☐ Now ☒ 1 to 5 years ☐ 6 to 10 years

Overall Comments

Should overlay, patch, waterproof and pave deck based on condition survey report and inspection. HCP for 31.5% of deck area. Consideration should be given to adding a sidewalk on the approaches. Convert expansion joints to semi-integral, replace parapet walls, broken deck drains, approach curb and gutter and guide rail. Concrete patch repairs to ballast walls, wingwalls and haunch. Remove curbs and construct one sidewalk.

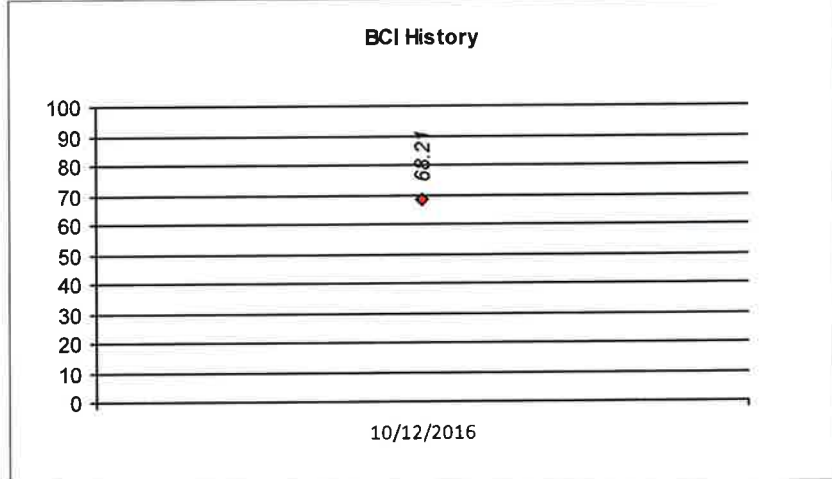
BCI Change Justification

Next Inspection 10/12/2018 mm/dd/yyyy

Estimated Load Limit t t t

Municipal Structure Inspection Form**Structure Number:** **Footbridge Rd Bridge****BCI History**

Insp. Date	BCI	Inspector
12-Oct-16	68.21	D. L. Baxter, P. Eng.



All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only, with potential discrepancies resulting from changes (over time) in the way quantities for certain elements are calculated.

Standard Codes**Suspected Performance Deficiencies**

- 00 None
- 01 Load carrying capacity
- 02 Excessive deformations (deflections/rotations)
- 03 Continuing settlement
- 04 Continuing movements
- 05 Seized bearings

- 06 Bearing not uniformly loaded/unstable
- 07 Jammed expansion joint
- 08 Pedestrian/vehicular hazard
- 09 Rough riding surface
- 10 Surface ponding
- 11 Deck drainage

- 12 Slippery surfaces
- 13 Flooding/channel blockage
- 14 Undermining of foundation
- 15 Unstable embankments
- 16 Other

Maintenance Needs

- 01 Lift and Swing Bridge Maintenance
- 02 Bridge Cleaning
- 03 Bridge Handrail Maintenance
- 04 Painting Steel Bridge Structures
- 05 Bridge Deck Joint Repair
- 06 Bridge Bearing Maintenance

- 07 Repair to Structural Steel
- 08 Repair of Bridge Concrete
- 09 Repair of Bridge Timber
- 10 Bailey Bridges - Maintenance
- 11 Animal/Pest Control
- 12 Bridge Surface Repair

- 13 Erosion Control at Bridges
- 14 Concrete Sealing
- 15 Rout and Seal
- 16 Bridge deck Drainage
- 17 Scaling (Loose Concrete or ACR Steel)
- 18 Other

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge**

Element Data

Abutments - Abutment Walls

Element Group	Abutments				Length	0.00	Width	9.46
Element Name	Abutment Walls				Height	1.80	Count	2.00
Location	East and West Sides				Total Quantity		34.06	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Conventional Closed				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	11.06	21.00	2.00	<input type="checkbox"/> Severe		

Comments

Delamination with spalling at southeast top corner of abutment. Top of footings exposed at both abutments. Both abutment walls have rust staining and several narrow cracks. Debris on bearing seats, narrow stained cracks, spall on bearing pedestal on west abutment, wet areas from leaking joints.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Rehab	1-5 yrs	\$10,000	Patch repair
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Abutments - Ballast Walls

Element Group	Abutments				Length	0.30	Width	9.46
Element Name	Ballast Walls				Height	1.60	Count	2.00
Location	At Abutments				Total Quantity		35.95	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	0.00	32.95	3.00	<input type="checkbox"/> Severe		

Comments

Numerous vertical narrow cracks, narrow stained cracks, rust staining, wet areas, delaminations, spalls on both walls.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Rehab	1-5 yrs	\$0	Replace with semi-integral joints (costed under Joints)
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Municipal Structure Inspection Form**Structure Number:** **Footbridge Rd Bridge****Abutments - Bearings**

Element Group	Abutments	Length	0.28	Width	0.40
Element Name	Bearings	Height	0.04	Count	4.00
Location	East Abutment	Total Quantity 4.00			
Material	Steel	<input type="checkbox"/> Limited Inspection			
Element Type	Elastomeric pad	Environment			
Protection System	None	<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	0.00	2.00	2.00
Comments	<input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Severe				

Light to severe corrosion of the bearing plates. Light to severe corrosion of bearing pins. Light to severe bulging, narrow to medium cracking of pads.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments

Barriers - Posts

Element Group	Barriers	Length	0.20	Width	0.20
Element Name	Posts	Height	0.80	Count	88.00
Location	Approaches	Total Quantity 88.00			
Material	Wood	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	88.00	0.00	0.00
Comments	<input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Severe				

Light checks and splits, light to medium weathering. Posts do not meet current standard.

Performance Deficiencies	Maintenance Needs	Priority	Comments
Load carrying capacity			

Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge**

Approaches - Approach Guiderail

Element Group	Approaches				Length	0.00	Width	0.00
Element Name	Approach Guiderail	Terminal End			Height	0.00	Count	4.00
Location	All Quadrants				Total Quantity 4.00			
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	4.00	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Guiderail in the northeast and southeast wrap into entrance.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost Comments

Replace

\$0 Costed under Approach Guide Rail

Abutments - Bearings

Element Group	Abutments				Length	0.28	Width	0.40
Element Name	Bearings				Height	0.12	Count	4.00
Location	West Abutment				Total Quantity 4.00			
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	Elastomeric pad				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	3.00	1.00	0.00	<input type="checkbox"/> Severe		

Comments

Severe corrosion of steel bearing plates. One small area on northwest bearing exposes steel within bearing.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost Comments

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge****Abutments - Wingwalls**

Element Group	Abutments				Length	4.75	Width	0.00
Element Name	Wingwalls				Height	1.50	Count	4.00
Location	All Quadrants				Total Quantity		28.50	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Reinforced concrete				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	26.50	1.00	1.00	<input type="checkbox"/> Severe		

Comments

Light scaling, spalls, delaminations, wet areas.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$3,000

Patch repairs

Accessories - Signs

Element Group	Accessories				Length	0.00	Width	0.00
Element Name	Signs				Height	0.00	Count	4.00
Location	All Quadrants				Total Quantity		4.00	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	4.00	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Hazard marker signs.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge**

Approaches - Approach Guiderail

Element Group	Approaches				Length	167.64	Width	0.00
Element Name	Approach Guiderail				Height	0.00	Count	0.00
Location	All Quadrants				Total Quantity		167.64	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	Steel Beam on Wood Posts				Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	167.64	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

9 panels at west approach, 13 panels at east approach. Few areas of localized light surface corrosion. Guide rail has no offset blocks. Guide rail attachment to bridge is not to current design standards. Minor scrape damage.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Replace	1-5 yrs	\$110,000	Replace Guide Rail
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Approaches - Wearing Surface

Element Group	Approaches				Length	6.00	Width	8.62
Element Name	Wearing Surface				Height	0.00	Count	2.00
Location	East and West Approaches				Total Quantity		103.44	
Material	Asphalt				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	93.44	6.00	4.00	<input checked="" type="checkbox"/> Severe		

Comments

Light wheel rutting, narrow to wide cracks, gap between approach asphalt and end dams, light ravelling.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge****Barriers - Barrier/Parapet Walls**

Element Group	Barriers				Length	132.00	Width	0.25
Element Name	Barrier/Parapet Walls		Interior		Height	0.60	Count	2.00
Location	North and South Sides				Total Quantity		224.40	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Parapet Wall with Two Rails				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	128.40	51.00	45.00	<input checked="" type="checkbox"/> Severe		

Comments

Light to medium spalls, light scaling, water staining, rust staining, delaminations, narrow to medium cracks. 20% of parapet walls exhibited HCP based on condition survey by SPL.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Replace	1-5 yrs	\$420,000	Replace Parapet Walls & Railing
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Barriers - Hand Railings

Element Group	Barriers				Length	131.00	Width	0.00
Element Name	Hand Railings				Height	0.00	Count	4.00
Location	North and South Sides				Total Quantity		524.00	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	Double Railing				Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	521.00	2.00	1.00	<input checked="" type="checkbox"/> Severe		

Comments

Light corrosion of anchor bolts, localized area of severe corrosion and perforations.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Replace	1-5 yrs	\$0	Costed under Barriers Interior
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Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge****Beams/MLE's - Diaphragms**

Element Group	Beams/MLE's				Length	2.60	Width	0.30
Element Name	Diaphragms	End			Height	1.22	Count	24.00
Location	At Abutments/Piers				Total Quantity		24.00	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	I-type				Environment			
Protection System	Red lead primer/alkyd				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	21.00	3.00	0.00	<input type="checkbox"/> Severe		

Comments

Light to medium corrosion, flaking of coating, efflorescence.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Barriers - Barrier/Parapet Walls**

Element Group	Barriers				Length	132.00	Width	0.00
Element Name	Barrier/Parapet Walls	Exterior			Height	0.60	Count	2.00
Location	North and South Sides				Total Quantity		158.40	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Parapet Wall with Two Rails				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	142.40	16.00	0.00	<input type="checkbox"/> Severe		

Comments

Narrow stained cracks, water staining.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Replace

1-5 yrs

\$0

Costed under Barriers Interior

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge****Beams/MLE's - Diaphragms**

Element Group	Beams/MLE's				Length	10.40	Width	0.15
Element Name	Diaphragms	Intermediate			Height	0.15	Count	60.00
Location					Total Quantity		60.00	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	Cross Type				Environment			
Protection System	Red lead primer/alkyd				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	60.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

Localized light corrosion.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Beams/MLE's - Girders**

Element Group	Beams/MLE's				Length	4.00	Width	0.40
Element Name	Girders	End			Height	1.22	Count	4.00
Location					Total Quantity		58.24	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	I-type				Environment			
Protection System	Red lead primer/alkyd				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	34.24	16.00	8.00	<input type="checkbox"/> Severe		

Comments

Two interior girder ends have light to medium corrosion and are in fair condition. Light to severe corrosion mainly on exterior girders, flaking.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** Footbridge Rd Bridge**Beams/MLE's - Girders**

Element Group	Beams/MLE's				Length	118.50	Width	0.40
Element Name	Girders	Middle			Height	1.22	Count	4.00
Location					Total Quantity		1725.36	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	I-type				Environment			
Protection System	Red lead primer/alkyd				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	1715.36	10.00	0.00	<input type="checkbox"/> Severe		

Comments

Light to medium corrosion below deck drains, localized light corrosion.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Coatings - Railing Systems/Hand Railings**

Element Group	Coatings				Length	131.00	Width	0.00
Element Name	Railing Systems/Hand Railings				Height	0.00	Count	4.00
Location	Double Tube Hand Railing				Total Quantity		164.50	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type	Hot dip galvanizing				Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	78.50	85.00	1.00	<input checked="" type="checkbox"/> Severe		

Comments**Performance Deficiencies**

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection FormStructure Number: **Footbridge Rd Bridge****Coatings - Structural Steel**

Element Group	Coatings				Length	0.00	Width	0.00
Element Name	Structural Steel				Height	0.00	Count	0.00
Location	Girder Ends				Total Quantity 43.68			
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type	Red lead primer/alkyd				Environment			
Protection System	Red lead primer/alkyd				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	0.00	0.00	43.68	<input type="checkbox"/> Severe		

Comments

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Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Coatings - Structural Steel

Element Group	Coatings				Length	0.00	Width	0.00
Element Name	Structural Steel				Height	0.00	Count	0.00
Location	Guiderail				Total Quantity 100.58			
Material					<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	100.58	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Localized light breakdown of protective coating.

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Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge**

Coatings - Structural Steel

Element Group	Coatings		Length	0.00	Width	0.00
Element Name	Structural Steel	Middle	Height	0.00	Count	0.00
Location	Girders		Total Quantity		1294.02	
Material	Other		<input type="checkbox"/> Limited Inspection			
Element Type	Red lead primer/alkyd		Environment			
Protection System	Red lead primer/alkyd		<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate
	sq. m	0.00	1262.02	16.00	16.00	<input type="checkbox"/> Severe

Comments

Coating loss below deck drains. Minor loss of coating in localized areas.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Coatings - Structural Steel

Element Group	Coatings		Length	0.00	Width	0.00
Element Name	Structural Steel	End	Height	0.00	Count	0.00
Location	Diaphragms		Total Quantity		208.00	
Material	Other		<input type="checkbox"/> Limited Inspection			
Element Type	Red lead primer/alkyd		Environment			
Protection System	Red lead primer/alkyd		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate
	sq. m	0.00	70.00	69.00	69.00	<input type="checkbox"/> Severe

Comments

Localized areas of coating flaking off end diaphragms due to surface corrosion.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form**Structure Number:** Footbridge Rd Bridge**Coatings - Structural Steel**

Element Group	Coatings				Length	0.00	Width	0.00
Element Name	Structural Steel	Middle			Height	0.00	Count	0.00
Location	Diaphragms				Total Quantity		375.00	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type	Red lead primer/alkyd				Environment			
Protection System	Red lead primer/alkyd				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	375.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

Localized light corrosion.

Performance Deficiencies

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Decks - Deck Top**

Element Group	Decks				Length	122.50	Width	10.40
Element Name	Deck Top				Height	0.00	Count	1.00
Location	Below Asphalt Wearing Surface				Total Quantity		1274.00	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	470.00	403.00	401.00	<input checked="" type="checkbox"/> Severe		

Comments

Based on condition of the asphalt and condition survey report by SPL dated Oct 17/2014. 31.5% HCP.

Performance Deficiencies

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$0

Costed under Deck Wearing Surface

Municipal Structure Inspection Form**Structure Number:** Footbridge Rd Bridge**Decks - Drainage**

Element Group	Decks				Length	0.00	Width	0.00
Element Name	Drainage				Height	0.00	Count	8.00
Location	All				Total Quantity 8.00			
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	Drain Pipe with Basins				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	5.00	1.00	2.00	<input checked="" type="checkbox"/> Severe		

Comments

150mm deck drain pipes. Localized light surface corrosion. Tops of some deck drains have light corrosion. Two drain pipes by east pier are broken and dislocated from gutter system at top causing leakage and corrosion of girders. Signs of water leakage also at drain on north side by west pier.

Performance Deficiencies

Deck drainage

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$5,000

Replace two drains near east pier. Repair leaking drain at northwest.

Decks - Soffit - Thin Slab

Element Group	Decks				Length	4.00	Width	10.40
Element Name	Soffit - Thin Slab				Height	0.00	Count	0.00
Location	End				Total Quantity 41.60			
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	38.60	2.00	1.00	<input type="checkbox"/> Severe		

Comments

Hairline to narrow cracks, delamination, narrow stained cracks, wet areas.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge****Decks - Soffit - Thin Slab**

Element Group	Decks				Length	118.50	Width	2.60
Element Name	Soffit - Thin Slab		Exterior		Height	0.00	Count	1.00
Location	Underside of Deck				Total Quantity		308.10	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	292.10	8.00	8.00	<input type="checkbox"/> Severe		

Comments

Narrow stained cracks, barn swallow nests.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Decks - Soffit - Thin Slab**

Element Group	Decks				Length	118.50	Width	7.80
Element Name	Soffit - Thin Slab		Interior		Height	0.00	Count	1.00
Location	Underside of Deck				Total Quantity		924.30	
Material	Cast-in-place concrete				<input checked="" type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	858.30	33.00	33.00	<input type="checkbox"/> Severe		

Comments

Rust staining, narrow stained and unstained cracks, wet areas, spalls, delaminations.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** Footbridge Rd Bridge**Decks - Wearing Surface**

Element Group	Decks				Length	122.50	Width	8.62
Element Name	Wearing Surface				Height	0.00	Count	1.00
Location	Top of Deck				Total Quantity		1055.95	
Material	Asphalt				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	983.95	68.00	4.00	<input checked="" type="checkbox"/> Severe		

Comments

Narrow to wide longitudinal and transverse cracks. Grass growing along edge adjacent to curb. Evidence of deck condition survey, light ravelling.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$725,000	Overlay, Waterproof & Pave

Embankments & Streams - Embankments

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Embankments				Height	0.00	Count	6.00
Location	All Quadrants, In Front of Abutments				Total Quantity		6.00	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	4.00	2.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Moderate erosion in the northeast and northwest quadrants near abutments.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:** **Footbridge Rd Bridge****Embankments & Streams - Slope Protection**

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Slope Protection				Height	0.00	Count	6.00
Location	All Quadrants, In Front of Abutments				Total Quantity		6.00	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	6.00	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

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Performance Deficiencies**Maintenance Needs****Priority** **Comments**

None

Rehab/Repair Recommendations**Priority****Cost****Comments****Embankments & Streams - Streams & Waterways**

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Streams & Waterways				Height	0.00	Count	1.00
Location	Through Structure				Total Quantity		1.00	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	All	0.00	1.00	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Minor build-up of debris along upstream side of east pier.

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Performance Deficiencies**Maintenance Needs****Priority** **Comments**

None

Rehab/Repair Recommendations**Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** **Footbridge Rd Bridge****Joints - Armouring/Retaining Devices**

Element Group	Joints	Length	10.40	Width	0.00
Element Name	Armouring/Retaining Devices	Height	0.00	Count	1.00
Location	West End of Deck (Finger Joint)	Total Quantity 10.40			
Material	Steel	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System	None	<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	m	0.00	10.40	0.00	0.00
Comments	<input checked="" type="checkbox"/> Severe				

Light localized surface corrosion. Cover plate not connected to curb at north side. Minor scrape damage.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments
Replace	1-5 yrs	\$0	Costed under seals

Joints - Concrete End Dams

Element Group	Joints	Length	8.62	Width	0.30
Element Name	Concrete End Dams	Height	0.00	Count	3.00
Location	At Joints	Total Quantity 7.80			
Material	Cast-in-place concrete	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System	None	<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	sq. m	0.00	3.80	3.00	1.00
Comments	<input checked="" type="checkbox"/> Severe				

Moderate abrasions, asphalt patches, narrow to medium cracks, delaminations.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:** **Footbridge Rd Bridge****Joints - Seals/Sealants**

Element Group	Joints				Length	10.40	Width	0.00
Element Name	Seals/Sealants				Height	0.00	Count	1.00
Location	At Joints				Total Quantity 1.00			
Material	Rubber				<input type="checkbox"/> Limited Inspection			
Element Type	Strip Seal				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	0.00	0.00	1.00	<input checked="" type="checkbox"/> Severe		

Comments

East expansion joint seal is torn and displaced at several locations. Evidence of leakage below.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Replace 1-5 yrs \$70,000 Replace expansion joints

Bracing - Bracing

Element Group	Bracing				Length	3.00	Width	0.15
Element Name	Bracing				Height	0.15	Count	16.00
Location	Underside of Deck				Total Quantity 16.00			
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	16.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments**Performance Deficiencies**

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** **Footbridge Rd Bridge****Piers - Bearings**

Element Group	Piers	Length	0.00	Width	0.00
Element Name	Bearings	Height	0.00	Count	8.00
Location	All	Total Quantity 8.00			
Material		<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System	None	<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	8.00	0.00	0.00
<input type="checkbox"/> Moderate					
<input type="checkbox"/> Severe					

Comments

Based on condition survey report by SPL. Pier bearings are in generally good condition with narrow cracks, minor bulging and severe corrosion on shoe plates.

Performance Deficiencies

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority** **Cost** **Comments****Piers - Shafts/Columns/Pile Bents**

Element Group	Piers	Length	0.80	Width	10.40
Element Name	Shafts/Columns/Pile Bents	Height	4.80	Count	2.00
Location	All	Total Quantity 215.04			
Material	Cast-in-place concrete	<input type="checkbox"/> Limited Inspection			
Element Type	Concrete shafts, pier walls	Environment			
Protection System	None	<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	sq. m	0.00	201.04	14.00	0.00
<input type="checkbox"/> Moderate					
<input type="checkbox"/> Severe					

Comments

Narrow stained and unstained cracks, wet areas, light honeycombing, localized medium cracks.

Performance Deficiencies

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority** **Cost** **Comments**

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge**

Sidewalks/curbs - Curbs

Element Group	Sidewalks/curbs				Length	127.25	Width	0.58
Element Name	Curbs				Height	0.20	Count	2.00
Location	North and South Sides				Total Quantity		198.50	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	185.50	11.00	2.00	<input checked="" type="checkbox"/> Severe		

Comments

Light scaling, delaminations, minor abrasions, narrow to medium cracks, 8% of area has HCP based on condition survey report by SPL.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Replace

1-5 yrs

\$250,000

Replace with sidewalk on one side

Foundations - Foundations (below ground level)

Element Group	Foundations				Length	0.00	Width	0.00
Element Name	Foundations (below ground level)				Height	0.00	Count	0.00
Location	At Abutments/Piers				Total Quantity		0.00	
Material					<input checked="" type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	N/A					<input type="checkbox"/> Severe		

Comments

Limited inspection.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form**Structure Number:** **Footbridge Rd Bridge****Repair/Rehabilitation Required**

Element Group	Element		Repair/Rehabilitation	Priority	Cost
Abutments	Abutment Walls		Rehab	1-5 yrs	\$10,000
Approaches	Approach Guiderail		Replace	1-5 yrs	\$110,000
Approaches	Approach Guiderail	Terminal	Replace		\$0
Joints	Armouring/Retaining Devices		Replace	1-5 yrs	\$0
Abutments	Ballast Walls		Rehab	1-5 yrs	\$0
Barriers	Barrier/Parapet Walls	Exterior	Replace	1-5 yrs	\$0
Barriers	Barrier/Parapet Walls	Interior	Replace	1-5 yrs	\$420,000
Sidewalks/curbs	Curbs		Replace	1-5 yrs	\$250,000
Decks	Deck Top		Rehab	1-5 yrs	\$0
Decks	Drainage		Rehab	1-5 yrs	\$5,000
Barriers	Hand Railings		Replace	1-5 yrs	\$0
Joints	Seals/Sealants		Replace	1-5 yrs	\$70,000
Decks	Wearing Surface		Rehab	1-5 yrs	\$725,000
Abutments	Wingwalls		Rehab	1-5 yrs	\$3,000
Total Repair/Rehabilitation Cost					\$1,593,000

Associated Work

	Comments		Estimated Cost
Approaches			\$100,000
Detours			\$0
Traffic Control			\$100,000
Utilities			\$0
Right-of-Way			\$0
Environmental Study			\$20,000
Other	Bond / Insurance / Access / Mobilization / Environmental		\$200,000
Contingencies		10%	** \$210,000
Engineering		20%	** \$410,000
Total Associated Work Cost			\$1,040,000
Total Repair/Rehabilitation Cost			\$1,593,000
Total Cost			\$2,633,000
Township of North Dumfries Share @ 100%			\$2,633,000

** If based on a percentage calculated values rounded-up to the nearest thousand dollars.

Justification

Municipal Structure Inspection Form

Structure Number: **Footbridge Rd Bridge**

--



Looking East at Bridge



Looking West at Bridge



South Elevation



Plaque on Bridge Barrier



Severe Corrosion and Perforations on Handrail



Light Spall on Interior Parapet Wall



Narrow Stained Cracks on Exterior Parapet Wall



Delamination on Curb



Wide Cracks on Deck Wearing Surface



East Expansion Joint



West Expansion Joint



Broken Deck Drain



Light Corrosion on Finger Joint



Moderate Abrasions on Concrete End Dam



Delamination on Concrete End Dams



Displaced Seal



Typical Middle Span Soffit



Delamination on Interior Soffit



Delamination on End Soffit



Typical End Span Soffit



Narrow Stained Cracks on Exterior Soffit



Light Corrosion on Deck Drain



Broken Deck Drain



Typical Bracing



Breakdown of Protective Coating



Severe Corrosion on End Girder



Localized Medium Corrosion on Girder Middle



Typical Intermediate Diaphragm



Typical End Diaphragm



Medium Corrosion on End Diaphragm



Typical Diaphragm at Pier



Typical Pier



Narrow Stained Crack on Pier



Typical Pier Bearing



East Abutment



West Abutment



Delamination on Abutment Wall



Typical East Abutment Bearing



Typical West Abutment Bearing



Severe Squashing of East Abutment Bearing



Delamination on Ballast Wall



Typical Wingwall



Spall on Wingwall



Looking North Upstream



Looking South Downstream



Minor Build-up of Debris in Watercourse



Gap Between End Dam and Approach Wearing Surface



Minor Collision Damage to Guiderail



Minor Breakdown of Protective Coating



Missing Bolts on Guiderail



Below Standard Guiderail Connection



Light Split in Approach Guiderail Post

Summary Action Report **Structure Jedburgh Dam Bridge (MTO Site No. Jedburgh Dam Bridge)** **Jedburgh Dam Bridge**

Inspection Date 10/12/2016 mm/dd/yyyy

Condition Index Value (BCI) 49.91

Next Biennial Inspection 10/12/2018 mm/dd/yyyy

Current Rep. Value \$372,167

Additional Investigations

Investigation	Priority	Cost	Investigation	Priority	Cost
Detailed Deck Condition Survey	Normal	\$10,000			
Concrete Substructure Condition Survey	Normal	\$5,000			
Additional investigations required see page 3 for details.					

Performance Deficiencies

Element Group	Element	Performance Deficiency
Approaches	Wearing Surface	Rough riding surface

Maintenance Needs

Element Group	Element	Maintenance Required	Priority	Comment
Accessories	Signs	Other	1 yr	Replace posting sign with legal signage
Decks	Wearing Surface	Bridge Surface Repair	1 yr	Patch potholes

Repair/Rehabilitation

Element Group	Element		Repair/Rehabilitation	Priority	Cost
Abutments	Abutment Walls	Rehab	Patch repairs	1-5 yrs	\$20,000
Abutments	Wingwalls	Rehab	Patch repair	1-5 yrs	\$5,000
Approaches	Approach Guiderail	Rehab	Replace guiderail and end treatments	1-5 yrs	\$70,000
Approaches	Wearing Surface	Rehab	Rout and seal cracks	1-5 yrs	\$5,000
Sidewalks/curbs	Curbs	Rehab	Concrete patch repair	1-5 yrs	\$5,000
Piers	Shafts/Columns/Pile Bents	Rehab	Patch repairs and crack injections	1-5 yrs	\$10,000
Barriers	Railing Systems	Rehab	Replace continuous with approach guiderail	1-5 yrs	\$4,000
Decks	Soffit - Thick Slab	Exterior	Rehab Patch repairs	1-5 yrs	\$5,000
Decks	Soffit - Thick Slab	Interior	Rehab Concrete patches	1-5 yrs	\$10,000
Decks	Wearing Surface	Rehab	Seal cracks	1-5 yrs	\$5,000
Total Repair/Rehabilitation Cost					\$139,000

Township of North Dumfries	100 %	\$224,000.00	Total Associated Work Cost	\$85,000
	%		Total Cost	\$224,000


Overall Comments

Concrete patch repairs to abutments, wingwalls, curbs, piers and soffit. Rout and seal cracks on approach wearing surface and deck wearing surface. Replace approach guide rail and provide guide rail continuous over the bridge.

Municipal Structure Inspection Form

Structure Number: **Jedburgh Dam Bridge**

Inventory Data

Structure Name	Jedburgh Dam Bridge		Hwy No.	Main St	Key Photo		
Cross. Type Over	<input type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Ped <input type="checkbox"/> Nav. Water <input checked="" type="checkbox"/> Non-Nav. Wat <input type="checkbox"/> Other						
Cross. Type Under	<input checked="" type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Ped <input type="checkbox"/> Nav. Water <input type="checkbox"/> Non-Nav. Wat <input type="checkbox"/> Other						
Road Name	Main Street						
Structure Location	Approximately 150m North of Scott Street						
Latitude	43.28867	Longitude	-80.44700	Cur. Rep. Value	\$372,167		
Owner(s)/ % Share	Township of North Dumfries		100 %	**			
Heritage Status	Not Considered for Designation						
MTO Region	Southwestern		Road Side Env.	Urban			
MTO District	London/Stratford		Road Class	Local			
Old County	Waterloo		Lane Type	Regular			
Geographic Twp.	North Dumfries		Posted Speed	50	No. of Lanes	1	
Structure Type	Solid Slab		AADT	0	Pct. Trucks	0	
Structure Material	Reinforced Cast-in-Place Concrete		Inspection Route Sequence				
Articulation	Continuous		Interchange Number				
Total Deck Length	8 m	Road Width	4.9	Interchange Structure Number			
Overall Width	5.2 m	Vert. Clear.	0	Detour Length	0 km	Skew Angle 0°	
Total Deck Area	41.60 m ²	No. of Spans	2	Fill on Structure	0 m	Struct. Dir. North/South	
Special Routes	<input type="checkbox"/> Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle Insp. Duration 1 hr						

** Current Replacement Value is based on in kind replacement of the existing structure and calculated using benchmark costs. Capital planning should consider site specific cost factors and requirements for widening or lengthening of the structure.

Spans

Span Name	Span Length	Span Name	Span Length
1	4.9 m	2	1.7 m

Historical Data

Year Built	1940	yyyy	Year of Last Major Rehab		yyyy
Last OSIM Inspection	06/04/2013	mm/dd/yyyy	Contract No. When Built		
Last Enhanced OSIM		mm/dd/yyyy	Last Evaluation		mm/dd/yyyy
Last Enhanced Access		mm/dd/yyyy	Current Load Limit	10 t	<input type="checkbox"/> t <input type="checkbox"/> t
Last Underwater Insp.		mm/dd/yyyy	Load Limit By-Law No.		mm/dd/yyyy
Last Condition Survey		mm/dd/yyyy	By-Law Expiry Date		mm/dd/yyyy

Rehab History

Rehab Date	Rehab Description
	Substructure repairs (date unknown)
1 / 1 / 2011	Approach wearing surface rehabilitation

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Field Inspection Information:**

Inspection Date	10/12/2016 mm/dd/yyyy	<input type="checkbox"/> Multi Day Inspection	<input checked="" type="checkbox"/> OSIM	<input type="checkbox"/> Enhanced OSIM	BCI	49.91
Inspector	D. L. Baxter, P. Eng.		Eng. Responsible D. L. Baxter, P. Eng.			
Others in Party	C. Harper		J. Parkinson			
Access Equip.	<input type="checkbox"/> Lift <input type="checkbox"/> Ladder <input type="checkbox"/> Boat <input type="checkbox"/> Bridge Master Other <input type="text"/>					
Other Equip.	Camera, Hammer, Other Hand Tools					
Weather	Sunny		Temperature	10 °C		

Additional Investigations Required:

Investigation	Priority			Estimated Cost
	None	Normal	Urgent	
Detailed Deck Condition Survey	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	\$10,000
Delamination Survey of Asphalt-Covered Deck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Concrete Substructure Condition Survey	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	\$5,000
Detailed Coating Condition Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Detailed Timber Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Post-Tensioned Strand Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Underwater Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Fatigue Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Seismic Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Structure Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Monitoring of Deformations, Movements and Settlements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Monitoring of Crack Widths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Investigation Notes				Total Cost \$15,000

A detailed deck and substructure condition survey should be carried out to confirm rehabilitation.

Overall Structure Notes:

Recommended Work on Structure	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Rehab	<input type="checkbox"/> Replace	<input type="checkbox"/> Remove
Timing of Recommended Work	<input type="checkbox"/> None	<input type="checkbox"/> Now	<input checked="" type="checkbox"/> 1 to 5 years	<input type="checkbox"/> 6 to 10 years

Overall Comments Concrete patch repairs to abutments, wingwalls, curbs, piers and soffit. Rout and seal cracks on approach wearing surface and deck wearing surface. Replace approach guide rail and provide guide rail continuous over the bridge.

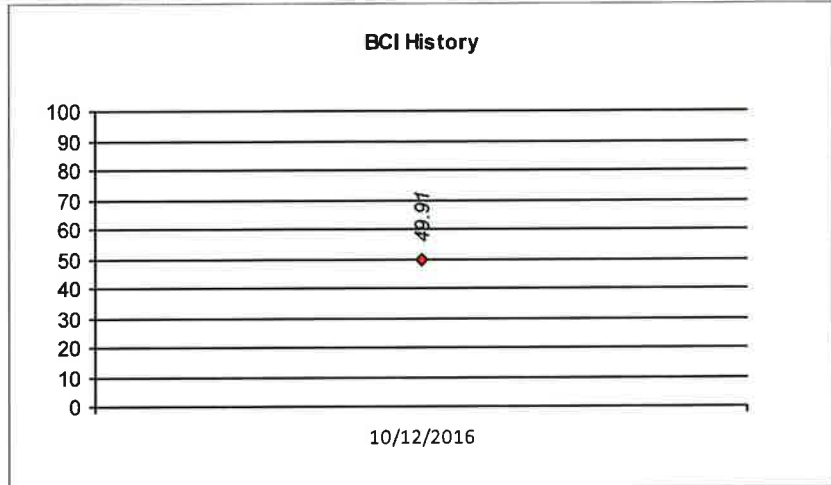
BCI Change Justification

Next Inspection 10/12/2018 mm/dd/yyyy

Estimated Load Limit t t t

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****BCI History**

Insp. Date	BCI	Inspector
12-Oct-16	49.91	D. L. Baxter, P. Eng.



All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only, with potential discrepancies resulting from changes (over time) in the way quantities for certain elements are calculated.

Standard Codes**Suspected Performance Deficiencies**

- 00 None
- 01 Load carrying capacity
- 02 Excessive deformations (deflections/rotations)
- 03 Continuing settlement
- 04 Continuing movements
- 05 Seized bearings

- 06 Bearing not uniformly loaded/unstable
- 07 Jammed expansion joint
- 08 Pedestrian/vehicular hazard
- 09 Rough riding surface
- 10 Surface ponding
- 11 Deck drainage

- 12 Slippery surfaces
- 13 Flooding/channel blockage
- 14 Undermining of foundation
- 15 Unstable embankments
- 16 Other

Maintenance Needs

- 01 Lift and Swing Bridge Maintenance
- 02 Bridge Cleaning
- 03 Bridge Handrail Maintenance
- 04 Painting Steel Bridge Structures
- 05 Bridge Deck Joint Repair
- 06 Bridge Bearing Maintenance

- 07 Repair to Structural Steel
- 08 Repair of Bridge Concrete
- 09 Repair of Bridge Timber
- 10 Bailey Bridges - Maintenance
- 11 Animal/Pest Control
- 12 Bridge Surface Repair

- 13 Erosion Control at Bridges
- 14 Concrete Sealing
- 15 Rout and Seal
- 16 Bridge deck Drainage
- 17 Scaling (Loose Concrete or ACR Steel)
- 18 Other

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Element Data****Abutments - Abutment Walls**

Element Group	Abutments				Length	0.00	Width	9.60
Element Name	Abutment Walls				Height	2.70	Count	2.00
Location	North and South Sides				Total Quantity		51.84	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Conventional Closed				Environment			
Protection System	None				<input checked="" type="checkbox"/> Benign			
Condition Data	<i>Units</i>	<i>Excell.</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<input type="checkbox"/> Moderate		
	sq. m	0.00	10.00	31.84	10.00	<input type="checkbox"/> Severe		

Comments

Spalls, concrete patches, debonded concrete patches. Light to severe scaling, delaminations, narrow stained cracks, efflorescence.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$20,000	Patch repairs

Abutments - Wingwalls

Element Group	Abutments				Length	1.20	Width	0.30
Element Name	Wingwalls				Height	1.00	Count	4.00
Location	All Quadrants				Total Quantity		4.80	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Reinforced concrete				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	<i>Units</i>	<i>Excell.</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	1.00	2.80	1.00	<input type="checkbox"/> Severe		

Comments

Light to medium scaling, narrow to medium cracks, debonded concrete patch in northwest and localized severe scaling in the northwest.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$5,000	Patch repair

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Accessories - Signs**

Element Group	Accessories	Length	0.00	Width	0.00										
Element Name	Signs	Height	0.00	Count	12.00										
Location	All Quadrants	Total Quantity 12.00													
Material	Steel	<input type="checkbox"/> Limited Inspection													
Element Type		Environment													
Protection System	None	<input type="checkbox"/> Benign													
Condition Data	<table border="1"> <tr> <th>Units</th> <th>Excell.</th> <th>Good</th> <th>Fair</th> <th>Poor</th> </tr> <tr> <td>Each</td> <td>0.00</td> <td>12.00</td> <td>0.00</td> <td>0.00</td> </tr> </table>	Units	Excell.	Good	Fair	Poor	Each	0.00	12.00	0.00	0.00	<input type="checkbox"/> Moderate			
Units	Excell.	Good	Fair	Poor											
Each	0.00	12.00	0.00	0.00											
Comments	<input checked="" type="checkbox"/> Severe														

4 hazard signs. 2 narrow bridge signs with one lane tabs, 2 - 10 tonne load limit signs with narrow bridge tabs.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None	Other	1 yr	Replace posting sign with legal signage

Rehab/Repair Recommendations	Priority	Cost	Comments
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Approaches - Approach Guiderail

Element Group	Approaches	Length	9.50	Width	0.00										
Element Name	Approach Guiderail	Height	0.55	Count	4.00										
Location	At Approaches	Total Quantity 38.00													
Material	Steel	<input type="checkbox"/> Limited Inspection													
Element Type	Steel Beam on Wood Posts	Environment													
Protection System	Hot dip galvanizing	<input type="checkbox"/> Benign													
Condition Data	<table border="1"> <tr> <th>Units</th> <th>Excell.</th> <th>Good</th> <th>Fair</th> <th>Poor</th> </tr> <tr> <td>m</td> <td>0.00</td> <td>38.00</td> <td>0.00</td> <td>0.00</td> </tr> </table>	Units	Excell.	Good	Fair	Poor	m	0.00	38.00	0.00	0.00	<input type="checkbox"/> Moderate			
Units	Excell.	Good	Fair	Poor											
m	0.00	38.00	0.00	0.00											
Comments	<input checked="" type="checkbox"/> Severe														

2 SBGR panels at each corner, 2.5 panels at northwest corner. All panels have been painted yellow. SBGR at northwest is bent to suit structure alignment and welded to bridge. Railing does not meet current design standards and is not attached to structure. Guiderail in the southwest quadrant is not attached to the end post. Guiderail is at a substandard height.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$70,000	Replace guiderail and end treatments

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Approaches - Wearing Surface**

Element Group	Approaches				Length	6.00	Width	4.90
Element Name	Wearing Surface				Height	0.00	Count	2.00
Location	North and South Approaches				Total Quantity		58.80	
Material	Asphalt				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	54.80	2.00	2.00	<input checked="" type="checkbox"/> Severe		

Comments

Settlement at both approaches. Wide transverse cracks at ends of deck, asphalt patches.

Performance Deficiencies

Rough riding surface

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$5,000

Rout and seal cracks

Barriers - Posts

Element Group	Barriers				Length	0.00	Width	0.15
Element Name	Posts				Height	0.65	Count	19.00
Location	On Approaches				Total Quantity		19.00	
Material	Timber				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	4.00	10.00	5.00	<input checked="" type="checkbox"/> Severe		

Comments

Light to severe rot, light to medium checking and splits. Posts do not meet current standard. Replacement costed under guiderail.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Coatings - Railing Systems/Hand Railings**

Element Group	Coatings				Length	0.00	Width	0.00
Element Name	Railing Systems/Hand Railings				Height	0.00	Count	0.00
Location	Approach Guiderail				Total Quantity		22.80	
Material	Epoxy Zinc/Acrylic				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	22.80	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Minor breakdown of protective coating.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Sidewalks/curbs - Curbs**

Element Group	Sidewalks/curbs				Length	9.10	Width	0.15
Element Name	Curbs				Height	0.10	Count	2.00
Location					Total Quantity		4.55	
Material					<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	1.55	2.00	1.00	<input checked="" type="checkbox"/> Severe		

Comments

Light scaling, light spalling, narrow stained and unstained cracks.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$5,000

Concrete patch repair

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Retaining walls - Walls**

Element Group	Retaining walls				Length	2.00	Width	0.30
Element Name	Walls				Height	1.20	Count	1.00
Location	Northeast Quadrant				Total Quantity 2.40			
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	1.40	1.00	0.00	<input type="checkbox"/> Severe		

Comments

Minor outward rotation, hairline stained map cracking.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Piers - Shafts/Columns/Pile Bents**

Element Group	Piers				Length	6.10	Width	0.45
Element Name	Shafts/Columns/Pile Bents				Height	2.70	Count	1.00
Location	Below Deck				Total Quantity 35.37			
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Concrete rectangular columns and shafts				Environment			
Protection System					<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	21.37	9.00	5.00	<input type="checkbox"/> Severe		

Comments

Light to severe scaling, narrow to wide cracks, concrete patches, debonded concrete patches, narrow stained cracks, delaminations.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$10,000

Patch repairs and crack injections

Municipal Structure Inspection Form

Structure Number: **Jedburgh Dam Bridge****Barriers - Railing Systems**

Element Group	Barriers	Length	8.80	Width	0.05
Element Name	Railing Systems	Height	0.90	Count	2.00
Location	East and West Sides	Total Quantity 61.80			
Material	Steel	<input type="checkbox"/> Limited Inspection			
Element Type	3 Rail Metal Railing - Steel	Environment			
Protection System	None	<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	m	0.00	0.00	60.80	1.00
<input checked="" type="checkbox"/> Severe					

Comments

3 rails and 5 posts for each railing. Rails are 50mm. Broken handrail post in northwest.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$4,000

Replace continuous with approach guiderail

Coatings - Railing Systems/Hand Railings

Element Group	Coatings	Length	0.00	Width	0.00
Element Name	Railing Systems/Hand Railings	Height	0.00	Count	0.00
Location	Railing System	Total Quantity 9.70			
Material	Other	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System	Other	<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	m	0.00	0.00	6.70	3.00
<input checked="" type="checkbox"/> Severe					

Comments

Medium to severe breakdown of protective coating.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Decks - Deck Top**

Element Group	Decks				Length	8.00	Width	5.20
Element Name	Deck Top				Height	0.00	Count	1.00
Location	Below Wearing Surface				Total Quantity		41.60	
Material	Cast-in-place concrete				<input checked="" type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	Other				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	37.60	3.00	1.00	<input type="checkbox"/> Severe		

Comments

--	--

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Decks - Soffit - Thick Slab**

Element Group	Decks				Length	8.00	Width	3.20
Element Name	Soffit - Thick Slab				Height	0.00	Count	0.00
Location	Underside of Deck				Total Quantity		25.60	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	20.60	4.00	1.00	<input type="checkbox"/> Severe		

Comments

Light to severe scaling, narrow stained cracks, spalling, concrete patches, efflorescence, stalactites, delaminations, concrete patches, wet areas.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$5,000

Patch repairs

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Approaches - Approach Guiderail**

Element Group	Approaches				Length	0.00	Width	0.00
Element Name	Approach Guiderail	Terminal End			Height	0.00	Count	4.00
Location	All Quadrants				Total Quantity 4.00			
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	4.00	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Terminal end treatments in all quadrants, minor collision damage in the southwest and northwest quadrants.

Performance Deficiencies

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Decks - Soffit - Thick Slab**

Element Group	Decks				Length	6.50	Width	3.20
Element Name	Soffit - Thick Slab	Interior			Height	0.40	Count	1.00
Location	Underside of Deck				Total Quantity 29.10			
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	18.10	7.00	4.00	<input type="checkbox"/> Severe		

Comments

Spalls, narrow to wide cracks, light to severe scaling, wet areas, narrow stained cracks, efflorescence.

Performance Deficiencies

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$10,000

Concrete patches

Municipal Structure Inspection Form

Structure Number: **Jedburgh Dam Bridge**

Decks - Wearing Surface

Element Group	Decks				Length	8.00	Width	4.90
Element Name	Wearing Surface				Height	0.00	Count	1.00
Location	Top of Deck				Total Quantity		39.20	
Material	Asphalt				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	27.20	7.00	5.00	<input checked="" type="checkbox"/> Severe		

Comments

Light to severe ravelling, minor potholes, narrow to wide cracks, localized map cracking, flushing.

Performance Deficiencies

None

Maintenance Needs

Bridge Surface Repair

Priority

1 yr

Comments

Patch potholes

Rehab/Repair Recommendations

Priority

1-5 yrs

Cost

\$5,000

Comments

Seal cracks

Embankments & Streams - Embankments

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Embankments				Height	0.00	Count	4.00
Location	All Quadrants				Total Quantity		4.00	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	4.00	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

GRCA gauge station located at southeast embankment.

Performance Deficiencies

None

Maintenance Needs

Priority

Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Embankments & Streams - Slope Protection**

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Slope Protection				Height	0.00	Count	4.00
Location	All Quadrants				Total Quantity 4.00			
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	4.00	0.00	0.00	<input checked="" type="checkbox"/> Severe		
Comments								

--	--	--	--	--	--	--	--	--

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Embankments & Streams - Streams & Waterways

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Streams & Waterways				Height	0.00	Count	1.00
Location	Through Structure				Total Quantity 1.00			
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	All	0.00	1.00	0.00	0.00	<input type="checkbox"/> Severe		
Comments								

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Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:** **Jedburgh Dam Bridge****Repair/Rehabilitation Required**

Element Group	Element		Repair/Rehabilitation	Priority	Cost
Abutments	Abutment Walls		Rehab	1-5 yrs	\$20,000
Approaches	Approach Guiderail		Rehab	1-5 yrs	\$70,000
Sidewalks/curbs	Curbs		Rehab	1-5 yrs	\$5,000
Barriers	Railing Systems		Rehab	1-5 yrs	\$4,000
Piers	Shafts/Columns/Pile Bents		Rehab	1-5 yrs	\$10,000
Decks	Soffit - Thick Slab	Interior	Rehab	1-5 yrs	\$10,000
Decks	Soffit - Thick Slab	Exterior	Rehab	1-5 yrs	\$5,000
Decks	Wearing Surface		Rehab	1-5 yrs	\$5,000
Approaches	Wearing Surface		Rehab	1-5 yrs	\$5,000
Abutments	Wingwalls		Rehab	1-5 yrs	\$5,000
Total Repair/Rehabilitation Cost					\$139,000

Associated Work

	Comments		Estimated Cost
Approaches			\$0
Detours			\$0
Traffic Control			\$10,000
Utilities			\$0
Right-of-Way			\$0
Environmental Study			\$0
Other	Mobilization/Bonds/Unwatering		\$22,000
Contingencies		10%	** \$18,000
Engineering		20%	** \$35,000
Total Associated Work Cost			\$85,000
Total Repair/Rehabilitation Cost			\$139,000
Total Cost			\$224,000
Township of North Dumfries Share @ 100%			\$224,000

** If based on a percentage calculated values rounded-up to the nearest thousand dollars.

Justification



Looking North at Bridge



Looking South at Bridge



West Elevation



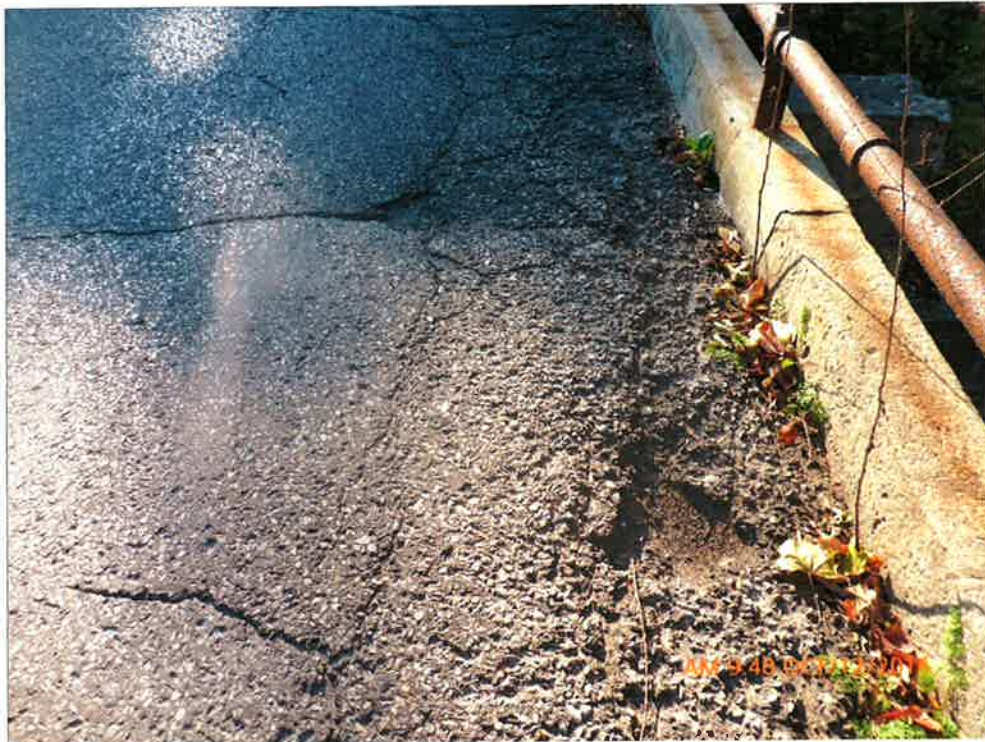
Flaking of Protective Coating on Handrail



Broken Handrail in Northwest



Light Spill on Curb



Minor Potholes on Deck Wearing Surface



Severe Delamination on Interior Soffit



Light Spall on Exterior Soffit



Typical Pier



Severe Delamination on Pier



Light Corrosion on Splash Guard



North Abutment



South Abutment



Severe Delamination on Abutment



Debonded Concrete Patch on Wingwall



Typical Retaining Wall



Minor Outward Rotation of Retaining Wall



Looking East Upstream



Looking West Downstream



Wide Crack in Approach Wearing Surface



Settlement on Approach



Typical Load Posting Sign on Approach



Guiderail Not Attached to Post



Severe Rot on Approach Guiderail Post

Summary Action Report
Structure Piper Street Bridge (MTO Site No. Piper Street Bridge)
Piper Street Bridge

Inspection Date 10/12/2016 mm/dd/yyyy

Condition Index Value (BCI) 67.87

Next Biennial Inspection 10/12/2018 mm/dd/yyyy

Current Rep. Value \$4,086,522

Additional Investigations

Investigation	Priority	Cost	Investigation	Priority	Cost
Detailed Deck Condition Survey	Normal	\$15,000			
Additional investigations required see page 3 for details.					

Performance Deficiencies

Element Group	Element	Performance Deficiency
Barriers	Posts	Load carrying capacity
Sidewalks/curbs	Sidewalks/Medians	Pedestrian/vehicular hazard

Maintenance Needs

Element Group	Element	Maintenance Required	Priority	Comment
Accessories	Utilities	Other	1 yr	Replace junction box cover plates
Barriers	Hand Railings	Bridge Handrail Maintenance	1 yr	Reposition/secure handrail
Barriers	Railing Systems	Bridge Handrail Maintenance	1 yr	Replace deteriorated panels

Repair/Rehabilitation

Element Group	Element		Repair/Rehabilitation	Priority	Cost
Accessories	Utilities	Conduit	Rehab	Replace corroded section of conduit	1-5 yrs \$5,000
Approaches	Wearing Surface		Rehab	Rout and seal cracks	1-5 yrs \$5,000
Barriers	Posts		Rehab	Should replace/upgrade approach guiderail	1-5 yrs \$70,000
Beams/MLE's	Girders	End	Rehab	Patch repairs and seal wide crack	1-5 yrs \$30,000
Beams/MLE's	Girders	Middle	Rehab	Patch repairs	1-5 yrs \$5,000
Decks	Wearing Surface		Rehab	Seal cracks	1-5 yrs \$5,000
Decks	Soffit - Thick Slab	Exterior	Rehab	Concrete patch repair	1-5 yrs \$5,000
Joints	Seals/Sealants		Replace	Replace joint seals	1-5 yrs \$41,000
Joints	Seals/Sealants		Replace	Replace joint seals	1-5 yrs \$41,000
Piers	Shafts/Columns/Pile Bents		Rehab	Patch repair	1-5 yrs \$10,000
Sidewalks/curbs	Curbs		Rehab	Patch repairs	1-5 yrs \$5,000
Sidewalks/curbs	Sidewalks/Medians		Rehab	Repair sidewalk	1-5 yrs \$10,000
Total Repair/Rehabilitation Cost					\$232,000

Township of North Dumfries	100%	\$348,000.00	Total Associated Work Cost	\$116,000
	%		Total Cost	\$348,000

Overall Comments

Replace utility conduit in curb. Rout and seal cracks in asphalt. Concrete patch repairs to girders, exterior soffit, piers and sidewalk. Replace seals at abutments and over piers. Should replace/upgrade guide rail.

Municipal Structure Inspection Form

Structure Number:

Piper Street Bridge

Inventory Data

Structure Name	Piper Street Bridge		Hwy No.	Piper St	Key Photo 		
Cross. Type Over	<input type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Ped <input checked="" type="checkbox"/> Nav. Water <input type="checkbox"/> Non-Nav. Wat <input type="checkbox"/> Other						
Cross. Type Under	<input checked="" type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Ped <input type="checkbox"/> Nav. Water <input type="checkbox"/> Non-Nav. Wat <input type="checkbox"/> Other						
Road Name	Piper Street						
Structure Location	Approximately 100m West of Northumberland Street						
Latitude	43.28423	Longitude	-80.46260	Cur. Rep. Value	\$4,086,522		
Owner(s)/ % Share	Township of North Dumfries		100 %	**			
MTO Region	Southwestern		Road Side Env.	Urban			
MTO District	London/Stratford		Road Class	Local			
Old County	Waterloo		Lane Type	Regular			
Geographic Twp.	North Dumfries		Posted Speed	50	No. of Lanes	2	
Structure Type	Box Beams or Girders		AADT	0	Pct. Trucks	0	
Structure Material	Reinforced Cast-in-Place Concrete		Inspection Route Sequence				
Articulation	Simply Supported		Interchange Number				
Total Deck Length	60 m	Road Width	9.2	Interchange Structure Number			
Overall Width	11.8 m	Vert. Clear.	0	Detour Length	0 km	Skew Angle	0°
Total Deck Area	708.00 m ²	No. of Spans	3	Fill on Structure	0 m	Struct. Dir.	East/West
Special Routes	<input type="checkbox"/> Transit <input checked="" type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle		Insp. Duration	1 hr			

** Current Replacement Value is based on in kind replacement of the existing structure and calculated using benchmark costs. Capital planning should consider site specific cost factors and requirements for widening or lengthening of the structure.

Spans

Span Name	Span Length	Span Name	Span Length
1	20.1 m	2	19.8 m
3	20.1 m		

Historical Data

Year Built	1967	yyyy	Year of Last Major Rehab		yyyy
Last OSIM Inspection	06/04/2013	mm/dd/yyyy	Contract No. When Built		
Last Enhanced OSIM		mm/dd/yyyy	Last Evaluation		mm/dd/yyyy
Last Enhanced Access		mm/dd/yyyy	Current Load Limit		t
Last Underwater Insp.		mm/dd/yyyy	Load Limit By-Law No.		mm/dd/yyyy
Last Condition Survey		mm/dd/yyyy	By-Law Expiry Date		mm/dd/yyyy

Rehab History

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Field Inspection Information:**

Inspection Date	10/12/2016 mm/dd/yyyy	<input type="checkbox"/> Multi Day Inspection	<input checked="" type="checkbox"/> OSIM	<input type="checkbox"/> Enhanced OSIM	BCI 67.87
Inspector	D. L. Baxter, P. Eng.		Eng. Responsible D. L. Baxter, P. Eng.		
Others in Party	C. Harper		J. Parkinson		
Access Equip.	<input type="checkbox"/> Lift <input type="checkbox"/> Ladder <input type="checkbox"/> Boat <input type="checkbox"/> Bridge Master Other				
Other Equip.	Camera, Hammer, Other Hand Tools				
Weather	Sunny		Temperature	18 °C	

Additional Investigations Required:

Investigation	None	Priority Normal	Urgent	Estimated Cost
Detailed Deck Condition Survey	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	\$15,000
Delamination Survey of Asphalt-Covered Deck	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Concrete Substructure Condition Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Detailed Coating Condition Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Detailed Timber Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Post-Tensioned Strand Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Underwater Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Fatigue Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Seismic Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Structure Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Monitoring of Deformations, Movements and Settlements	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Monitoring of Crack Widths	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Investigation Notes				Total Cost \$15,000

A detailed condition survey will confirm the presence of a concrete topping and will confirm rehabilitation.

Overall Structure Notes:

Recommended Work on Structure ☐ None ☒ Rehab ☐ Replace ☐ Remove

Timing of Recommended Work ☐ None ☐ Now ☒ 1 to 5 years ☐ 6 to 10 years

Overall Comments Replace utility conduit in curb. Rout and seal cracks in asphalt. Concrete patch repairs to girders, exterior soffit, piers and sidewalk. Replace seals at abutments and over piers. Should replace/upgrade guide rail.

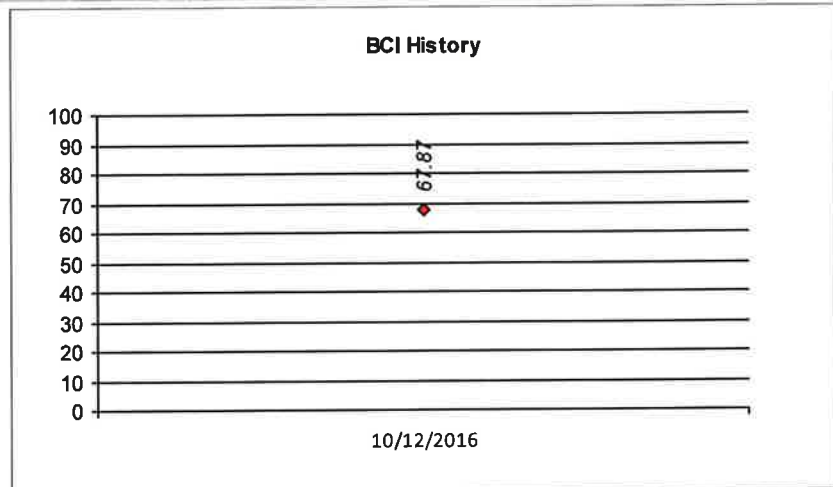
BCI Change Justification

Next Inspection 10/12/2018 mm/dd/yyyy

Estimated Load Limit ☐ t ☐ t ☐ t

Municipal Structure Inspection Form**Structure Number:****Piper Street Bridge****BCI History**

Insp. Date	BCI	Inspector
12-Oct-16	67.87	D. L. Baxter, P. Eng.



All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only, with potential discrepancies resulting from changes (over time) in the way quantities for certain elements are calculated.

Standard Codes**Suspected Performance Deficiencies**

- 00 None
- 01 Load carrying capacity
- 02 Excessive deformations (deflections/rotations)
- 03 Continuing settlement
- 04 Continuing movements
- 05 Seized bearings

- 06 Bearing not uniformly loaded/unstable
- 07 Jammed expansion joint
- 08 Pedestrian/vehicular hazard
- 09 Rough riding surface
- 10 Surface ponding
- 11 Deck drainage

- 12 Slippery surfaces
- 13 Flooding/channel blockage
- 14 Undermining of foundation
- 15 Unstable embankments
- 16 Other

Maintenance Needs

- 01 Lift and Swing Bridge Maintenance
- 02 Bridge Cleaning
- 03 Bridge Handrail Maintenance
- 04 Painting Steel Bridge Structures
- 05 Bridge Deck Joint Repair
- 06 Bridge Bearing Maintenance

- 07 Repair to Structural Steel
- 08 Repair of Bridge Concrete
- 09 Repair of Bridge Timber
- 10 Bailey Bridges - Maintenance
- 11 Animal/Pest Control
- 12 Bridge Surface Repair

- 13 Erosion Control at Bridges
- 14 Concrete Sealing
- 15 Rout and Seal
- 16 Bridge deck Drainage
- 17 Scaling (Loose Concrete or ACR Steel)
- 18 Other

Municipal Structure Inspection Form

Structure Number: **Piper Street Bridge**

Element Data

Abutments - Abutment Walls

Element Group	Abutments				Length	0.00	Width	11.00
Element Name	Abutment Walls				Height	3.40	Count	2.00
Location	East and West Sides				Total Quantity			
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Conventional Closed				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	66.80	8.00	0.00	<input type="checkbox"/> Severe		

Comments

Hairline to narrow cracks at both abutments, wet areas, water staining, rust staining.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Abutments - Bearings

Element Group	Abutments				Length	0.00	Width	0.00
Element Name	Bearings				Height	0.00	Count	2.00
Location	At Abutments				Total Quantity			
Material					<input checked="" type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	2.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

Bearings not visible. Assumed to be in fair condition.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Abutments - Wingwalls**

Element Group	Abutments	Length	3.50	Width	0.00
Element Name	Wingwalls	Height	1.25	Count	3.00
Location	Northeast, Northwest & Southwest		Total Quantity 13.13		
Material	Cast-in-place concrete		<input type="checkbox"/> Limited Inspection		
Element Type	Reinforced concrete		Environment		
Protection System	None		<input type="checkbox"/> Benign		
Condition Data	<i>Units</i>	<i>Excell.</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>
	sq. m	0.00	13.13	0.00	0.00
Comments	<input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Severe				

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments

Approaches - Approach Slabs

Element Group	Approaches	Length	6.00	Width	9.20
Element Name	Approach Slabs	Height	0.00	Count	2.00
Location	East and West Sides		Total Quantity 110.40		
Material	Cast-in-place concrete		<input type="checkbox"/> Limited Inspection		
Element Type			Environment		
Protection System	Hot rubberized asphalt membrane		<input type="checkbox"/> Benign		
Condition Data	<i>Units</i>	<i>Excell.</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>
	sq. m	0.00	108.40	2.00	0.00
Comments	<input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Severe				

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Abutments - Wingwalls**

Element Group	Abutments	Length	8.00	Width	0.30
Element Name	Wingwalls	Height	2.50	Count	1.00
Location	Southeast Quadrant	Total Quantity 20.00			
Material	Cast-in-place concrete	<input type="checkbox"/> Limited Inspection			
Element Type	Reinforced concrete	Environment			
Protection System		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	sq. m	0.00	19.00	1.00	0.00
Comments	<input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Severe				

Narrow stained crack, light to medium scaling and rust staining.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Accessories - Utilities

Element Group	Accessories	Length	0.00	Width	0.00
Element Name	Utilities	Height	0.00	Count	2.00
Location	Inside North Curb	Total Quantity 2.00			
Material		<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	1.00	0.00	1.00
Comments	<input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Severe				

Severe corrosion of north conduit.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$5,000	Replace corroded section of conduit

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Accessories - Utilities**

Element Group	Accessories	Length	0.00	Width	0.00
Element Name	Utilities	Height	0.00	Count	6.00
Location	North Exterior Soffit	Total Quantity 6.00			
Material		<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System		<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	2.00	4.00	0.00
<input type="checkbox"/> Moderate					
<input type="checkbox"/> Severe					

Comments

Conduits on exterior soffit, some conduits are abandoned. All 6 are not continuous across bridge.

Performance Deficiencies

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority** **Cost** **Comments****Accessories - Utilities**

Element Group	Accessories	Length	0.00	Width	0.00
Element Name	Utilities	Light Poles	Height	0.00	Count 3.00
Location	South Side of Bridge	Total Quantity 3.00			
Material		<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	3.00	0.00	0.00
<input checked="" type="checkbox"/> Moderate					
<input type="checkbox"/> Severe					

Comments**Performance Deficiencies**

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority** **Cost** **Comments**

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Accessories - Utilities**

Element Group	Accessories	Length	0.00	Width	0.00
Element Name	Utilities	Height	0.00	Count	3.00
Location	South Curb	Total Quantity 3.00			
Material		<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	0.00	0.00	3.00
Comments	<input checked="" type="checkbox"/> Severe				

Junction box cover plates are missing. Junction boxes filled with asphalt.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None	Other	1 yr	Replace junction box cover plates
Rehab/Repair Recommendations	Priority	Cost	Comments

Approaches - Approach Guiderail

Element Group	Approaches	Length	26.67	Width	0.08
Element Name	Approach Guiderail	Height	0.52	Count	1.00
Location	Southwest Approach	Total Quantity 26.67			
Material	Steel	<input type="checkbox"/> Limited Inspection			
Element Type	Steel Beam on Wood Posts	Environment			
Protection System	Hot dip galvanizing	<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	m	0.00	26.67	0.00	0.00
Comments	<input checked="" type="checkbox"/> Severe				

Light corrosion.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Approaches - Wearing Surface**

Element Group	Approaches	Length	6.00	Width	9.20
Element Name	Wearing Surface	Height	0.00	Count	2.00
Location	East and West Sides	Total Quantity 110.40			
Material	Asphalt	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System	None	<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	sq. m	0.00	104.40	4.00	2.00
<input checked="" type="checkbox"/> Severe					

Comments

Medium to wide transverse cracks in asphalt at west approach at end of deck. Narrow transverse crack at east approach.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab 1-5 yrs \$5,000 Rout and seal cracks

Barriers - Posts

Element Group	Barriers	Length	0.00	Width	0.15
Element Name	Posts	Height	0.65	Count	8.00
Location	Southwest Approach	Total Quantity 8.00			
Material	Timber	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	8.00	0.00	0.00
<input checked="" type="checkbox"/> Severe					

Comments

Light checks and splits, light to moderate weathering. Intermediate guiderail posts are not provided. The current posts do not meet standard.

Performance Deficiencies

Load carrying capacity

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab 1-5 yrs \$70,000 Should replace/upgrade approach guiderail

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Coatings - Structural Steel**

Element Group	Coatings	Length	0.00	Width	0.00
Element Name	Structural Steel	Height	0.00	Count	0.00
Location	Approach Guiderail	Total Quantity 16.00			
Material	Hot Dip Galvanizing	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System		<input type="checkbox"/> Benign			
Condition Data		<input type="checkbox"/> Moderate			
		<input checked="" type="checkbox"/> Severe			
Condition Data	Units	Excell.	Good	Fair	Poor
	m	0.00	15.00	0.00	1.00

Comments

Breakdown of protective coating.

Performance Deficiencies

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Approaches - Approach Guiderail**

Element Group	Approaches	Length	0.00	Width	0.00
Element Name	Approach Guiderail	Height	0.00	Count	1.00
Location	Southwest Quadrant	Total Quantity 1.00			
Material	Steel	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System	Hot dip galvanizing	<input type="checkbox"/> Benign			
Condition Data		<input type="checkbox"/> Moderate			
		<input checked="" type="checkbox"/> Severe			
Condition Data	Units	Excell.	Good	Fair	Poor
	Each	0.00	1.00	0.00	0.00

Comments**Performance Deficiencies**

None

Maintenance Needs**Priority** **Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form

Structure Number: **Piper Street Bridge**

Barriers - Barrier/Parapet Walls

Element Group	Barriers				Length	67.20	Width	0.00
Element Name	Barrier/Parapet Walls		Interior		Height	0.85	Count	2.00
Location	North and South Sides				Total Quantity		114.24	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Parapet Wall with Two Rails				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	113.24	1.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Light scaling, narrow cracks, minor abrasions, narrow stained crack in southeast.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Barriers - Hand Railings

Element Group	Barriers				Length	66.00	Width	0.00
Element Name	Hand Railings				Height	0.00	Count	4.00
Location	North and South Sides				Total Quantity		264.00	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	Double Railing				Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	263.00	1.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Loose and missing post anchor bolts at multiple locations. Light surface corrosion on anchor bolts. Travelling of the rails, minor collision damage.

Performance Deficiencies

None

Maintenance Needs

Priority

Comments

Bridge Handrail Maintenance

1 yr

Reposition/secure handrail

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Barriers - Railing Systems**

Element Group	Barriers	Length	60.00	Width	0.04										
Element Name	Railing Systems	Height	0.91	Count	1.00										
Location	South Side	Total Quantity 60.00													
Material	Steel	<input type="checkbox"/> Limited Inspection													
Element Type	Splash Guard Railing	Environment													
Protection System	Hot dip galvanizing	<input type="checkbox"/> Benign													
Condition Data	<table border="1"> <tr> <th>Units</th> <th>Excell.</th> <th>Good</th> <th>Fair</th> <th>Poor</th> </tr> <tr> <td>m</td> <td>0.00</td> <td>55.00</td> <td>4.00</td> <td>1.00</td> </tr> </table>	Units	Excell.	Good	Fair	Poor	m	0.00	55.00	4.00	1.00	<input type="checkbox"/> Moderate			
Units	Excell.	Good	Fair	Poor											
m	0.00	55.00	4.00	1.00											
Comments	<input checked="" type="checkbox"/> Severe														

Localized areas of light to severe corrosion with pitting and perforations. Light corrosion on anchor bolts.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None	Bridge Handrail Maintenance	1 yr	Replace deteriorated panels
Rehab/Repair Recommendations	Priority	Cost	Comments

Barriers - Barrier/Parapet Walls

Element Group	Barriers	Length	67.20	Width	0.00										
Element Name	Barrier/Parapet Walls	Exterior	Height	0.60	Count 2.00										
Location	North and South Sides	Total Quantity 80.64													
Material	Cast-in-place concrete	<input type="checkbox"/> Limited Inspection													
Element Type	Parapet Wall with Two Rails	Environment													
Protection System		<input type="checkbox"/> Benign													
Condition Data	<table border="1"> <tr> <th>Units</th> <th>Excell.</th> <th>Good</th> <th>Fair</th> <th>Poor</th> </tr> <tr> <td>sq. m</td> <td>0.00</td> <td>79.64</td> <td>1.00</td> <td>0.00</td> </tr> </table>	Units	Excell.	Good	Fair	Poor	sq. m	0.00	79.64	1.00	0.00	<input checked="" type="checkbox"/> Moderate			
Units	Excell.	Good	Fair	Poor											
sq. m	0.00	79.64	1.00	0.00											
Comments	<input type="checkbox"/> Severe														

Water staining, narrow stained crack.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Coatings - Structural Steel**

Element Group	Coatings				Length	60.00	Width	0.04
Element Name	Structural Steel				Height	0.91	Count	1.00
Location	South Side - Steel Splash Guard				Total Quantity		60.00	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	55.00	4.00	1.00	<input checked="" type="checkbox"/> Severe		
Comments								

Light to severe breakdown of protective coating.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments

Beams/MLE's - Girders

Element Group	Beams/MLE's				Length	12.00	Width	1.22
Element Name	Girders				Height	0.00	Count	9.00
Location	Abutments/Piers				Total Quantity		131.76	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Box/Trapezoidal				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	116.76	11.00	4.00	<input type="checkbox"/> Severe		
Comments								

Ends of girders have leakage between units, some with efflorescence, spalling. Some rust staining at locations of reinforcing steel chairs, wide longitudinal cracks, wet areas. Severe spall and delamination on underside of southwest.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$30,000	Patch repairs and seal wide crack

Municipal Structure Inspection Form

Structure Number:

Piper Street Bridge

Beams/MLE's - Girders

Element Group	Beams/MLE's		Length	48.00	Width	1.22
Element Name	Girders	Middle	Height	0.60	Count	9.00
Location			Total Quantity			527.04
Material	Cast-in-place concrete		<input type="checkbox"/> Limited Inspection			
Element Type	Box/Trapezoidal		Environment			
Protection System	None		<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate
	sq. m	0.00	481.04	43.00	3.00	<input type="checkbox"/> Severe

Comments

Leakage typical between units, efflorescence, wide crack with efflorescence, rust staining, spalling, wet areas, hairline stained cracks, delaminations, pop-outs.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Rehab	1-5 yrs	\$5,000	Patch repairs
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Coatings - Railing Systems/Hand Railings

Element Group	Coatings		Length	66.00	Width	0.00
Element Name	Railing Systems/Hand Railings		Height	0.00	Count	4.00
Location	Double Tube Hand Railing		Total Quantity			82.90
Material	Other		<input type="checkbox"/> Limited Inspection			
Element Type	Hot dip galvanizing		Environment			
Protection System	Hot dip galvanizing		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate
	sq. m	0.00	27.63	0.00	55.27	<input checked="" type="checkbox"/> Severe

Comments

Severe breakdown of protective coating.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form

Structure Number: **Piper Street Bridge**

Retaining walls - Walls

Element Group	Retaining walls				Length	5.20	Width	0.40
Element Name	Walls				Height	1.25	Count	3.00
Location	Northeast, Northwest & Southwest				Total Quantity		19.50	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Reinforced concrete				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	17.50	2.00	0.00	<input type="checkbox"/> Severe		

Comments

Light to medium scaling, narrow to medium cracks, narrow stained cracks.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Decks - Wearing Surface

Element Group	Decks				Length	60.00	Width	9.20
Element Name	Wearing Surface				Height	0.00	Count	1.00
Location	Top of Deck				Total Quantity		552.00	
Material	Asphalt				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	544.50	2.00	5.50	<input checked="" type="checkbox"/> Severe		

Comments

Longitudinal narrow cracking of asphalt for full length of deck at north side. Asphalt patches at each pier joint, cracking, localized wide cracks, wide transverse cracks over piers.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Rehab 1-5 yrs \$5,000 Seal cracks

Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Decks - Deck Top**

Element Group	Decks				Length	60.00	Width	11.80
Element Name	Deck Top				Height	0.00	Count	1.00
Location	Below Wearing Surface				Total Quantity		708.00	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	sq. m	0.00	702.50	5.50	0.00	<input type="checkbox"/> Severe		
Comments								

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Embankments & Streams - Embankments

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Embankments				Height	0.00	Count	6.00
Location	In Front of Abutments, All Quadrants				Total Quantity		6.00	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	6.00	0.00	0.00	<input type="checkbox"/> Severe		
Comments								

Embankment around west pier exhibits moderate erosion.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form

Structure Number: **Piper Street Bridge****Decks - Soffit - Thick Slab**

Element Group	Decks				Length	60.00	Width	1.30
Element Name	Soffit - Thick Slab		Exterior		Height	0.00	Count	1.00
Location	Underside of Deck				Total Quantity		78.00	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	70.00	5.00	3.00	<input checked="" type="checkbox"/> Severe		

Comments

Light to moderate spalling, rust stains, narrow stained cracks, wet areas.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$5,000	Concrete patch repair

Embankments & Streams - Slope Protection

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Slope Protection				Height	0.00	Count	4.00
Location	At Embankments				Total Quantity		4.00	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	4.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection FormStructure Number: **Piper Street Bridge****Embankments & Streams - Streams & Waterways**

Element Group	Embankments & Streams				Length	0.00	Width	0.00
Element Name	Streams & Waterways				Height	0.00	Count	1.00
Location	Through Structure				Total Quantity 1.00			
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	1.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

Minor build-up of debris on east pier.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Joints - Seals/Sealants**

Element Group	Joints				Length	11.80	Width	0.00
Element Name	Seals/Sealants				Height	0.00	Count	2.00
Location	At Abutments				Total Quantity 23.60			
Material					<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	0.00	0.00	23.60	<input checked="" type="checkbox"/> Severe		

Comments

Joints are paved over with asphalt. Leakage at both joint locations.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Replace

1-5 yrs

\$41,000

Replace joint seals

Municipal Structure Inspection Form

Structure Number: **Piper Street Bridge****Joints - Seals/Sealants**

Element Group	Joints				Length	11.80	Width	0.00
Element Name	Seals/Sealants				Height	0.00	Count	2.00
Location	At Piers				Total Quantity			23.60
Material					<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	0.00	0.00	23.60	<input checked="" type="checkbox"/> Severe		

Comments

Joints are paved over. Joints are leaking.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Replace

1-5 yrs

\$41,000

Replace joint seals

Piers - Bearings

Element Group	Piers				Length	0.00	Width	0.00
Element Name	Bearings				Height	0.00	Count	4.00
Location	All				Total Quantity			4.00
Material					<input checked="" type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	Each	0.00	0.00	4.00	0.00	<input type="checkbox"/> Severe		

Comments**Performance Deficiencies**

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form

Structure Number: **Piper Street Bridge**

Piers - Shafts/Columns/Pile Bents

Element Group	Piers	Length	0.60	Width	6.70
Element Name	Shafts/Columns/Pile Bents	Height	4.50	Count	2.00
Location	All	Total Quantity		157.20	
Material	Cast-in-place concrete	<input type="checkbox"/> Limited Inspection			
Element Type	Concrete shafts, pier walls	Environment			
Protection System	None	<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	sq. m	0.00	79.20	72.00	6.00
<input type="checkbox"/> Moderate					
<input type="checkbox"/> Severe					

Comments

Narrow to medium vertical cracks at all pier shafts at overhang beam corners, rust staining, light to severe scaling, wet areas, spalls and delaminations.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Rehab	1-5 yrs	\$10,000	Patch repair
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Sidewalks/curbs - Curbs

Element Group	Sidewalks/curbs	Length	67.20	Width	0.60
Element Name	Curbs	Height	0.22	Count	1.00
Location	North Side	Total Quantity		55.10	
Material	Cast-in-place concrete	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System	None	<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor
	sq. m	0.00	52.10	2.00	1.00
<input type="checkbox"/> Moderate					
<input checked="" type="checkbox"/> Severe					

Comments

Delaminations, light scaling, narrow cracks, rust staining, minor abrasions, exposed corroded rebar.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Rehab	1-5 yrs	\$5,000	Patch repairs
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Municipal Structure Inspection Form**Structure Number:** **Piper Street Bridge****Sidewalks/curbs - Sidewalks/Medians**

Element Group	Sidewalks/curbs	Length	72.00	Width	1.50
Element Name	Sidewalks/Medians	Height	0.22	Count	1.00
Location	South Side	Total Quantity 123.84			
Material	Cast-in-place concrete	<input type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System	None	<input type="checkbox"/> Benign			
Condition Data		<input type="checkbox"/> Moderate			
	Units	Excell.	Good	Fair	Poor
	sq. m	0.00	110.84	8.00	5.00
Comments	<input checked="" type="checkbox"/> Severe				

Light to medium scaling at sidewalk, rust staining. Electrical junction boxes in sidewalk are missing cover plates and have been filled with cold patch. Delaminations, narrow to medium cracks, small spall areas with exposed rebars at vertical face along roadway. Joint at east pier has no seal and is open creating a possible trip hazard.

Performance Deficiencies	Maintenance Needs	Priority	Comments
Pedestrian/vehicular hazard			

Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$10,000	Repair sidewalk

Foundations - Foundations (below ground level)

Element Group	Foundations	Length	0.00	Width	0.00
Element Name	Foundations (below ground level)	Height	0.00	Count	0.00
Location	Abutments/Pier	Total Quantity 0.00			
Material		<input checked="" type="checkbox"/> Limited Inspection			
Element Type		Environment			
Protection System		<input checked="" type="checkbox"/> Benign			
Condition Data		<input type="checkbox"/> Moderate			
	Units	Excell.	Good	Fair	Poor
	N/A				
Comments	<input type="checkbox"/> Severe				

Limited inspection.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:****Piper Street Bridge****Repair/Rehabilitation Required**

Element Group	Element		Repair/Rehabilitation	Priority	Cost
Sidewalks/curbs	Curbs		Rehab	1-5 yrs	\$5,000
Beams/ML's	Girders	Middle	Rehab	1-5 yrs	\$5,000
Beams/ML's	Girders	End	Rehab	1-5 yrs	\$30,000
Barriers	Posts		Rehab	1-5 yrs	\$70,000
Joints	Seals/Sealants		Replace	1-5 yrs	\$41,000
Joints	Seals/Sealants		Replace	1-5 yrs	\$41,000
Piers	Shafts/Columns/Pile Bents		Rehab	1-5 yrs	\$10,000
Sidewalks/curbs	Sidewalks/Medians		Rehab	1-5 yrs	\$10,000
Decks	Soffit - Thick Slab	Exterior	Rehab	1-5 yrs	\$5,000
Accessories	Utilities	Conduit	Rehab	1-5 yrs	\$5,000
Decks	Wearing Surface		Rehab	1-5 yrs	\$5,000
Approaches	Wearing Surface		Rehab	1-5 yrs	\$5,000
Total Repair/Rehabilitation Cost					\$232,000

Associated Work

	Comments		Estimated Cost
Approaches			\$0
Detours			\$0
Traffic Control			\$10,000
Utilities			\$0
Right-of-Way			\$0
Environmental Study			\$0
Other	Mobilization/Bonds/Access		\$25,000
Contingencies		10%	** \$27,000
Engineering		20%	** \$54,000
Total Associated Work Cost			\$116,000
Total Repair/Rehabilitation Cost			\$232,000
Total Cost			\$348,000
Township of North Dumfries Share @ 100%			\$348,000

** If based on a percentage calculated values rounded-up to the nearest thousand dollars.

Justification

Municipal Structure Inspection Form

Structure Number:

Piper Street Bridge

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Looking East at Bridge



Looking West at Bridge



North Elevation



South Elevation



Breakdown of Protective Coating



Minor Collision Damage to Handrail



Delamination on Curb



Localized Wide Cracks on Deck Wearing Surface



Perforation on Pedestrian Splash Barrier



Narrow Stained Crack on Interior Parapet Wall



Narrow Stained Crack on Exterior Parapet Wall



Typical Soffit



Moderate Spall on Exterior Soffit



Wide Longitudinal Crack in Box Beam Middle



Wide Longitudinal Crack in Box Beam at End



Severe Spall on Beam at End



Typical Pier



Minor Erosion Around West Pier



Severe Spall on Pier



East Pier Joint



West Pier Joint



Severely Corroded Utility at Joint



Typical Pier Bearing



East Abutment



West Abutment



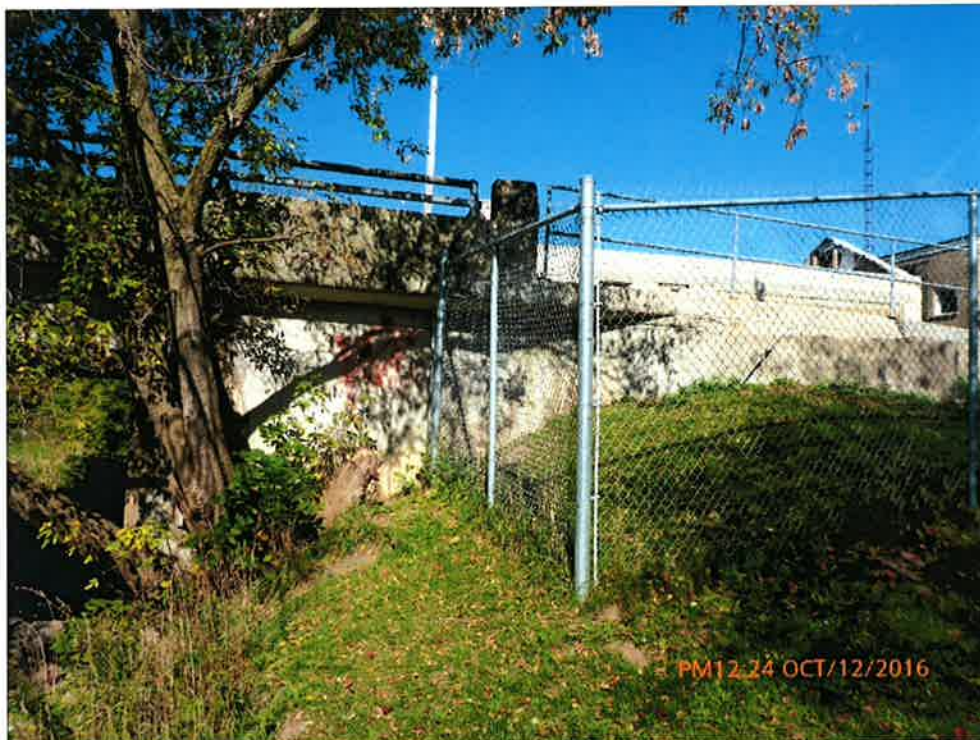
Rust Stains on Abutment Wall



Squashed Abutment Bearing



Typical Wingwall



Typical Southeast Wingwall



Narrow Stained Crack on Southeast Wingwall



Typical Retaining Wall



Narrow Stained Crack on Retaining Wall



Looking South Downstream



Loose Anchor Bolts on Handrail Post



Wide Crack at End of Deck on Approach



Missing Junction Box Cover Plate in Sidewalk



Severe Delamination on Sidewalk



Localized Breakdown of Protective Coating on Approach Guiderail



Moderate Weathering of Guiderail Post

Summary Action Report
Structure Shellard Road Bridge (MTO Site No. Shellard Road Bridge)
Shellard Road Bridge (Sideroad 17) over Mill Creek

Inspection Date 10/12/2016 mm/dd/yyyy

Condition Index Value (BCI) **82.43**

Next Biennial Inspection 10/12/2018 mm/dd/yyyy

Current Rep. Value **\$543,788**

Additional Investigations

Investigation	Priority	Cost	Investigation	Priority	Cost
No additional investigations required.					

Performance Deficiencies

Element Group	Element	Performance Deficiency
Approaches	Wearing Surface	Rough riding surface

Maintenance Needs

Element Group	Element	Maintenance Required	Priority	Comment
Decks	Deck Top	Bridge Cleaning	2 yr	Clean deck
Barriers	Hand Railings	Bridge Handrail Maintenance	2 yr	Replace missing bolts
Approaches	Wearing Surface	Bridge Surface Repair	1 yr	Patch potholes/pad approaches
Approaches	Approach Guiderail	Bridge Handrail Maintenance	2 yr	Replace damaged section of flex beam

Repair/Rehabilitation

Element Group	Element	Repair/Rehabilitation	Priority	Cost
Decks	Deck Top	Rehab Seal cracks	1-5 yrs	\$5,000
Joints	Armouring/Retaining Devices	Rehab Repair broken section of armouring angle	1-5 yrs	\$5,000
Abutments	Abutment Walls	Rehab Patch repair	6-10 yrs	\$5,000
Total Repair/Rehabilitation Cost				\$15,000

Township of North Dumfries	100 %	\$32,000.00	Total Associated Work Cost	\$17,000
	%		Total Cost	\$32,000


Overall Comments

1 - 5 years: Seal cracks in deck top, repair broken section of armouring angle.
 6 - 10 years: Patch abutment.

Municipal Structure Inspection Form

Structure Number: **Shellard Road Bridge**

Inventory Data

Structure Name	Shellard Road Bridge (Sideroad 17) over Mill Creek		Hwy No.	Shellard	Key Photo		
Cross. Type Over	<input type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Ped <input checked="" type="checkbox"/> Nav. Water <input type="checkbox"/> Non-Nav. Wat <input type="checkbox"/> Other						
Cross. Type Under	<input checked="" type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Ped <input type="checkbox"/> Nav. Water <input type="checkbox"/> Non-Nav. Wat <input type="checkbox"/> Other						
Road Name	Shellard Sideroad (Sideroad 17)						
Structure Location	Approximately 50m South of Gore Road						
Latitude	43.38787	Longitude	-80.26037	Cur. Rep. Value	\$543,788		
Owner(s)/ % Share	Township of North Dumfries		100	%	**		
MTO Region	Southwestern		Road Side Env.	Rural			
MTO District	London/Stratford		Road Class	Local			
Old County	Waterloo		Lane Type	Regular			
Geographic Twp.	North Dumfries		Posted Speed	80	No. of Lanes	2	
Structure Type	I-Beam or Girders		AADT	0	Pct. Trucks	0	
Structure Material	Structural Steel		Inspection Route Sequence				
Articulation	Fixed		Interchange Number				
Total Deck Length	8.53	m	Road Width	6.8	Interchange Structure Number		
Overall Width	7.42	m	Vert. Clear.	0	Detour Length	0 km	
Total Deck Area	63.29	m ²	No. of Spans	1	Fill on Structure	0 m	
Special Routes	<input type="checkbox"/> Transit <input checked="" type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle		Insp. Duration	1	hr	Skew Angle 0°	
					Struct. Dir.	North/South	

** Current Replacement Value is based on in kind replacement of the existing structure and calculated using benchmark costs. Capital planning should consider site specific cost factors and requirements for widening or lengthening of the structure.

Spans

Span Name	Span Length	Span Name	Span Length
1	7.3 m		

Historical Data

Year Built	1940	yyyy	Year of Last Major Rehab	2009	yyyy
Last OSIM Inspection	06/04/2016	mm/dd/yyyy	Contract No. When Built		
Last Enhanced OSIM		mm/dd/yyyy	Last Evaluation		
Last Enhanced Access		mm/dd/yyyy	Current Load Limit	<input type="checkbox"/> t <input type="checkbox"/> t <input type="checkbox"/> t	
Last Underwater Insp.		mm/dd/yyyy	Load Limit By-Law No.		
Last Condition Survey		mm/dd/yyyy	By-Law Expiry Date		

Rehab History

Rehab Date	Rehab Description
1 /1 /2009	Complete deck replacement and widening including replacement of steel girders, concrete barrier system and approach works.

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****Field Inspection Information:**

Inspection Date	10/12/2016 mm/dd/yyyy	<input type="checkbox"/> Multi Day Inspection	<input checked="" type="checkbox"/> OSIM	<input type="checkbox"/> Enhanced OSIM	BCI	82.43
Inspector	D. L. Baxter, P. Eng.		Eng. Responsible D. L. Baxter, P. Eng.			
Others in Party	C. Harper		J. Parkinson			
Access Equip.	<input type="checkbox"/> Lift	<input checked="" type="checkbox"/> Ladder	<input type="checkbox"/> Boat	<input type="checkbox"/> Bridge Master	Other	
Other Equip.	Camera, Hammer, Other Hand Tools					
Weather	Sunny		Temperature	20 °C		

Additional Investigations Required:

Investigation	Priority			Estimated Cost
	None	Normal	Urgent	
Detailed Deck Condition Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Delamination Survey of Asphalt-Covered Deck	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Concrete Substructure Condition Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Detailed Coating Condition Survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Detailed Timber Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Post-Tensioned Strand Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Underwater Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Fatigue Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Seismic Investigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Structure Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Monitoring of Deformations, Movements and Settlements	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	\$0
Monitoring of Crack Widths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Investigation Notes				Total Cost \$0

Overall Structure Notes:

Recommended Work on Structure	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Rehab	<input type="checkbox"/> Replace	<input type="checkbox"/> Remove
Timing of Recommended Work	<input type="checkbox"/> None	<input type="checkbox"/> Now	<input checked="" type="checkbox"/> 1 to 5 years	<input type="checkbox"/> 6 to 10 years

Overall Comments

1 - 5 years: Seal cracks in deck top, repair broken section of armouring angle.

6 - 10 years: Patch abutment.

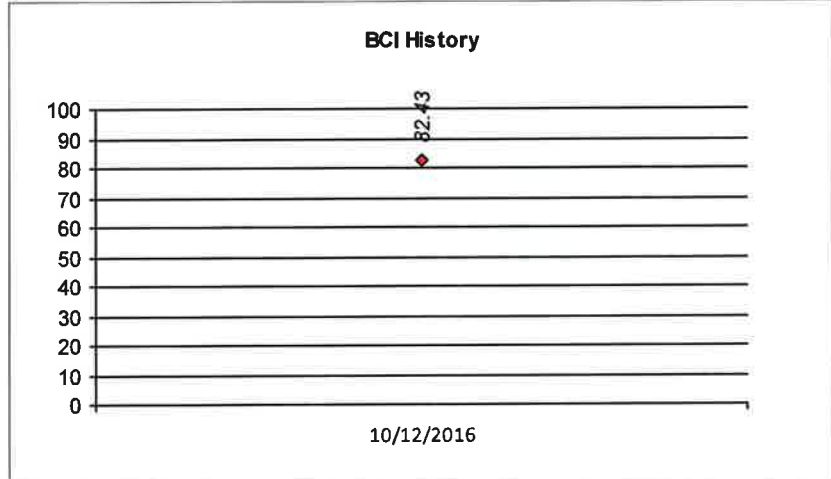
BCI Change Justification

Next Inspection 10/12/2018 mm/dd/yyyy

Estimated Load Limit ☐ t ☐ t ☐ t

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****BCI History**

Insp. Date	BCI	Inspector
12-Oct-16	82.43	D. L. Baxter, P. Eng.



All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only, with potential discrepancies resulting from changes (over time) in the way quantities for certain elements are calculated.

Standard Codes**Suspected Performance Deficiencies**

- 00 None
- 01 Load carrying capacity
- 02 Excessive deformations (deflections/rotations)
- 03 Continuing settlement
- 04 Continuing movements
- 05 Seized bearings

- 06 Bearing not uniformly loaded/unstable
- 07 Jammed expansion joint
- 08 Pedestrian/vehicular hazard
- 09 Rough riding surface
- 10 Surface ponding
- 11 Deck drainage

- 12 Slippery surfaces
- 13 Flooding/channel blockage
- 14 Undermining of foundation
- 15 Unstable embankments
- 16 Other

Maintenance Needs

- 01 Lift and Swing Bridge Maintenance
- 02 Bridge Cleaning
- 03 Bridge Handrail Maintenance
- 04 Painting Steel Bridge Structures
- 05 Bridge Deck Joint Repair
- 06 Bridge Bearing Maintenance

- 07 Repair to Structural Steel
- 08 Repair of Bridge Concrete
- 09 Repair of Bridge Timber
- 10 Bailey Bridges - Maintenance
- 11 Animal/Pest Control
- 12 Bridge Surface Repair

- 13 Erosion Control at Bridges
- 14 Concrete Sealing
- 15 Rout and Seal
- 16 Bridge deck Drainage
- 17 Scaling (Loose Concrete or ACR Steel)
- 18 Other

Municipal Structure Inspection Form

Structure Number: **Shellard Road Bridge**

Element Data

Decks - Deck Top

Element Group	Decks				Length	8.53	Width	7.42
Element Name	Deck Top				Height	0.00	Count	1.00
Location	Wearing Surface				Total Quantity		63.29	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m2	0.00	46.29	10.00	7.00	<input checked="" type="checkbox"/> Severe		

Comments

Exposed concrete deck surface new in 2009. Thin concrete overlay over 4 precast deck units. Narrow transverse cracking of overlay at locations between precast units (2 full width cracks at ends, 3 spread out through centre). Small area of pattern cracking at northwest corner adjacent to parapet walls. Narrow to wide cracks, build-up of sand.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None	Bridge Cleaning	2 yr	Clean deck

Rehab/Repair Recommendations	Priority	Cost	Comments
Rehab	1-5 yrs	\$5,000	Seal cracks

Decks - Soffit - Thin Slab

Element Group	Decks				Length	7.30	Width	1.70
Element Name	Soffit - Thin Slab		Exterior		Height	0.00	Count	1.00
Location	Underside of Deck				Total Quantity		12.41	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	m2	9.41	1.00	1.00	1.00	<input type="checkbox"/> Severe		

Comments

Narrow stained cracks, efflorescence.

Performance Deficiencies	Maintenance Needs	Priority	Comments
None			

Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****Decks - Soffit - Thin Slab**

Element Group	Decks		Length	7.30	Width	5.20
Element Name	Soffit - Thin Slab	Interior	Height	0.00	Count	1.00
Location	Underside of Deck		Total Quantity			37.96
Material	Precast concrete		<input type="checkbox"/> Limited Inspection			
Element Type			Environment			
Protection System	None		<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate
	m2	34.96	1.00	1.00	1.00	<input type="checkbox"/> Severe

Comments

Soffit consists of bottoms of pre-cast deck units. Narrow stained crack, efflorescence.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Joints - Armouring/Retaining Devices**

Element Group	Joints		Length	6.80	Width	0.08
Element Name	Armouring/Retaining Devices		Height	0.00	Count	2.00
Location	Armouring Angle		Total Quantity			13.60
Material			<input type="checkbox"/> Limited Inspection			
Element Type			Environment			
Protection System			<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate
	m	0.00	10.60	0.00	3.00	<input checked="" type="checkbox"/> Severe

Comments

Minor abrasions, broken at south end.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab

1-5 yrs

\$5,000

Repair broken section of armouring angle

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****Barriers - Barrier/Parapet Walls**

Element Group	Barriers				Length	13.90	Width	0.26
Element Name	Barrier/Parapet Walls	Exterior		Height	0.80	Count	2.00	
Location	East and West Sides				Total Quantity		22.24	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Parapet Wall with single railing				Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input checked="" type="checkbox"/> Moderate		
	m2	22.24	0.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

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Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Barriers - Barrier/Parapet Walls**

Element Group	Barriers				Length	13.90	Width	0.00
Element Name	Barrier/Parapet Walls	Interior		Height	1.06	Count	2.00	
Location	East and West Sides				Total Quantity		29.47	
Material	Cast-in-place concrete				<input type="checkbox"/> Limited Inspection			
Element Type	Parapet Wall with single railing				Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m2	0.00	27.47	2.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

Concrete barrier system new in 2009. Hairline stained map cracking, narrow stained and unstained cracks.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form

Structure Number: **Shellard Road Bridge**

Barriers - Posts

Element Group	Barriers				Length	0.10	Width	0.15
Element Name	Posts				Height	0.82	Count	60.00
Location	All Quadrants				Total Quantity		60.00	
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	0.00	60.00	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

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Performance Deficiencies

None

Maintenance Needs

Priority Comments

Rehab/Repair Recommendations

Priority

Cost

Comments

Barriers - Hand Railings

Element Group	Barriers				Length	12.90	Width	0.00
Element Name	Hand Railings				Height	0.00	Count	2.00
Location	East and West Sides				Total Quantity		25.80	
Material	Aluminum				<input type="checkbox"/> Limited Inspection			
Element Type	Single Railing				Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	0.00	19.80	6.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments

3 J-bolts missing west side, 1 missing on east side.

Performance Deficiencies

None

Maintenance Needs

Priority Comments

Bridge Handrail Maintenance

2 yr

Replace missing bolts

Rehab/Repair Recommendations

Priority

Cost

Comments

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****Beams/MLE's - Girders**

Element Group	Beams/MLE's				Length	8.00	Width	0.20
Element Name	Girders				Height	0.31	Count	5.00
Location	All				Total Quantity			48.40
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	I-type				Environment			
Protection System	Red lead primer/alkyd				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m2	47.40	1.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

Light corrosion

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Beams/MLE's - Diaphragms**

Element Group	Beams/MLE's				Length	1.50	Width	0.00
Element Name	Diaphragms				Height	0.00	Count	4.00
Location	All				Total Quantity			4.00
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	I-type				Environment			
Protection System	Red lead primer/alkyd				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	Each	3.00	1.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

Light corrosion.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****Coatings - Structural Steel**

Element Group	Coatings				Length	0.00	Width	0.00
Element Name	Structural Steel				Height	0.00	Count	0.00
Location	Girders/Diaphragms				Total Quantity		48.40	
Material	Other				<input type="checkbox"/> Limited Inspection			
Element Type	Red lead primer/alkyd				Environment			
Protection System	Red lead primer/alkyd				<input checked="" type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m2	47.40	1.00	0.00	0.00	<input type="checkbox"/> Severe		

Comments

Minor breakdown of protective coating.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Coatings - Railing Systems/Hand Railings**

Element Group	Coatings				Length	0.00	Width	0.00
Element Name	Railing Systems/Hand Railings				Height	0.00	Count	0.00
Location	Guiderail & Posts				Total Quantity		90.72	
Material	Hot Dip Galvanizing				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	90.72	0.00	0.00	<input checked="" type="checkbox"/> Severe		

Comments**Performance Deficiencies**

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****Abutments - Abutment Walls**

Element Group	Abutments	Length	0.00	Width	6.62										
Element Name	Abutment Walls	Height	1.10	Count	2.00										
Location	North and South Sides	Total Quantity 14.56													
Material	Cast-in-place concrete	<input checked="" type="checkbox"/> Limited Inspection													
Element Type	Conventional Closed	Environment													
Protection System	None	<input type="checkbox"/> Benign													
Condition Data	<table border="1"> <tr> <th>Units</th> <th>Excell.</th> <th>Good</th> <th>Fair</th> <th>Poor</th> </tr> <tr> <td>m2</td> <td>2.00</td> <td>10.56</td> <td>1.00</td> <td>1.00</td> </tr> </table>	Units	Excell.	Good	Fair	Poor	m2	2.00	10.56	1.00	1.00	<input checked="" type="checkbox"/> Moderate			
Units	Excell.	Good	Fair	Poor											
m2	2.00	10.56	1.00	1.00											
		<input type="checkbox"/> Severe													

Comments

Light scaling, concrete patches, narrow stained cracks, spalls.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Rehab 6-10 yrs \$5,000 Patch repair

Abutments - Wingwalls

Element Group	Abutments	Length	3.30	Width	0.00										
Element Name	Wingwalls	Height	1.60	Count	4.00										
Location	Corners of Structure	Total Quantity 21.12													
Material	Cast-in-place concrete	<input type="checkbox"/> Limited Inspection													
Element Type	Reinforced concrete	Environment													
Protection System	None	<input type="checkbox"/> Benign													
Condition Data	<table border="1"> <tr> <th>Units</th> <th>Excell.</th> <th>Good</th> <th>Fair</th> <th>Poor</th> </tr> <tr> <td>m2</td> <td>13.20</td> <td>5.92</td> <td>2.00</td> <td>0.00</td> </tr> </table>	Units	Excell.	Good	Fair	Poor	m2	13.20	5.92	2.00	0.00	<input checked="" type="checkbox"/> Moderate			
Units	Excell.	Good	Fair	Poor											
m2	13.20	5.92	2.00	0.00											
		<input type="checkbox"/> Severe													

Comments

Narrow to medium cracks with efflorescence staining, rust stains, narrow stained cracks.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments**

Municipal Structure Inspection Form

Structure Number: **Shellard Road Bridge**

Approaches - Wearing Surface

Element Group	Approaches				Length	6.00	Width	6.80
Element Name	Wearing Surface				Height	0.00	Count	2.00
Location	North and South				Total Quantity		81.60	
Material	Asphalt				<input type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System	None				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	sq. m	0.00	80.60	0.00	1.00	<input checked="" type="checkbox"/> Severe		

Comments

New approach asphalt wearing surface in 2009. Approach asphalt has settled at both ends of bridge, minor potholes, narrow cracks, settlement adjacent to armouring angles.

Performance Deficiencies	Maintenance Needs	Priority	Comments
Rough riding surface	Bridge Surface Repair	1 yr	Patch potholes/pad approaches
Rehab/Repair Recommendations	Priority	Cost	Comments

Approaches - Approach Guiderail

Element Group	Approaches		Length	0.00	Width	0.00
Element Name	Approach Guiderail	Extruder	Height	0.00	Count	4.00
Location	All Quadrants		Total Quantity		4.00	
Material	Steel		<input type="checkbox"/> Limited Inspection			
Element Type			Environment			
Protection System	Hot dip galvanizing		<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate
	sq. m	0.00	4.00	0.00	0.00	<input checked="" type="checkbox"/> Severe

Comments

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Performance Deficiencies	Maintenance Needs	Priority	Comments
None			
Rehab/Repair Recommendations	Priority	Cost	Comments

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****Foundations - Foundations (below ground level)**

Element Group	Foundations				Length	0.00	Width	0.00
Element Name	Foundations (below ground level)				Height	0.00	Count	0.00
Location	At Abutments				Total Quantity 0.00			
Material					<input checked="" type="checkbox"/> Limited Inspection			
Element Type					Environment			
Protection System					<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	N/A					<input type="checkbox"/> Severe		

Comments

Limited inspection.

Performance Deficiencies

None

Maintenance Needs**Priority Comments****Rehab/Repair Recommendations****Priority****Cost****Comments****Approaches - Approach Guiderail**

Element Group	Approaches				Length	19.05	Width	0.00
Element Name	Approach Guiderail				Height	0.00	Count	4.00
Location	At Approaches				Total Quantity 76.20			
Material	Steel				<input type="checkbox"/> Limited Inspection			
Element Type	Steel Beam on Steel Posts				Environment			
Protection System	Hot dip galvanizing				<input type="checkbox"/> Benign			
Condition Data	Units	Excell.	Good	Fair	Poor	<input type="checkbox"/> Moderate		
	m	11.20	63.00	1.00	1.00	<input checked="" type="checkbox"/> Severe		

Comments

Severe collision damage in Southwest quadrant.

Performance Deficiencies

None

Maintenance Needs**Priority****Comments**

Bridge Handrail Maintenance

2 yr

Replace damaged section of flex beam

Rehab/Repair Recommendations**Priority****Cost****Comments**

Municipal Structure Inspection Form**Structure Number:** **Shellard Road Bridge****Repair/Rehabilitation Required**

Element Group	Element	Repair/Rehabilitation	Priority	Cost
Abutments	Abutment Walls	Rehab	6-10 yrs	\$5,000
Joints	Armouring/Retaining Devices	Rehab	1-5 yrs	\$5,000
Decks	Deck Top	Rehab	1-5 yrs	\$5,000
Total Repair/Rehabilitation Cost				\$15,000

Associated Work

	Comments		Estimated Cost
Approaches			\$0
Detours			\$0
Traffic Control			\$5,000
Utilities			\$0
Right-of-Way			\$0
Environmental Study			\$0
Other	Mobilization/Bonds		\$1,000
Contingencies		10%	** \$3,000
Engineering		%	** \$8,000
Total Associated Work Cost			\$17,000
Total Repair/Rehabilitation Cost			\$15,000
Total Cost			\$32,000
Township of North Dumfries Share @ 100%			\$32,000

** If based on a percentage calculated values rounded-up to the nearest thousand dollars.

Justification



Looking North at Bridge



Looking South at Bridge



East Elevation



West Elevation



Severe Collision Damage to Guiderail



Narrow Stained Cracks on Interior Parapet Wall



Narrow Stained Cracks on Exterior Parapet Wall



Build-up of Debris on Deck



Wide Crack on Exposed Concrete Deck



Missing Section of Armoring Angle



North Armouring Angle



Typical Soffit



Narrow Stained Crack on Interior Soffit



Narrow Stained Cracks on Exterior Soffit



Light Corrosion on Girder



Typical Diaphragm



Light Corrosion on Diaphragm



Breakdown of Protective Coating



North Abutment



South Abutment



Light Spall on Abutment Below Girders



Typical Wingwall



Narrow Stained Crack on Wingwall



Looking East Upstream



Looking West Downstream



Pothole on Approach Wearing Surface



Settlement on Approach