

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.:02



Photo 7 Typical buried end treatment and rotted post at southeast corner



Photo 8 Collision damage noted on approach barrier at southwest corner

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.:02



Photo 9 Medium transverse cracks with potholes in west approach



Photo 10 Significant abrasion noted on approach curb at northwest corner

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.:02



Photo 11 Narrow map cracks with efflorescence and stains with spall on parapet wall



Photo 12 Narrow map cracks with efflorescence and stains with spall on parapet wall

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.:02



Photo 13 Narrow longitudinal and transverse cracks and damp stains on fascia.



Photo 14 Narrow cracks, damp stains with efflorescence, & graffiti on southeast wingwall.

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.:02



Photo 15 Typical deck soffit



Photo 16 Narrow longitudinal cracks noted with origins at abutment wall

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.:02



Photo 17 Minor washout noted at southwest corner near deck end



Photo 18 Typical southwest wingwall with graffiti and damp map cracks throughout

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.:02



Photo 19 Typical northwest embankment with rock protection at base



Photo 20 Narrow full length vertical cracks and graffiti noted on abutment walls (Typical)

Structure Condition Summary Form

Structure Name Boxwell Road Bridge
Structure Number 07
Date of Inspection June 3, 2022
Project No. 22035
Consultant HP Engineering Inc.

Element Group	Element Name	Unit (Qty.)	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition (1.00)	Element Quantity in Good Condition (0.75)	Element Quantity in Fair Condition (0.4)	Element Quantity in Poor Condition (0)	Total Replacement Value (TRV)	Current Element Value (CEV)	Element Condition Index	Performance Deficiency	Maintenance Need
Abutment	Abutment Walls	Sq.m	900.00	9.20	0.00	5.60	2.60	1.00	8280	4716	57	00	08
	Wingwalls	Sq.m	350.00	7.00	0.00	3.00	2.00	2.00	2450	1068	44	00	08
Approaches	Wearing Surface	Sq.m	6.00	264.00	0.00	144.00	100.00	20.00	1584	888	56	09	12
Barriers	Barrier/ Parapet Walls	Sq.m	100.00	14.40	0.00	0.00	12.90	1.50	1440	516	36	08	00
Beams / Main	Girders	Sq.m	200.00	21.60	0.00	15.60	3.00	3.00	4320	2580	60	00	08
Decks	Deck Top - Thick Slab	Sq.m	350.00	33.12	0.00	13.12	18.00	2.00	11592	5964	51	00	08, 02
	Soffit - Thick Slab	Sq.m	350.00	36.00	0.00	29.00	5.00	2.00	12600	8313	66	00	08

42266 24044

Bridge Condition Index (BCI)

57

I_t

0

Importance Factor for Traffic

I_c

0

Importance Factor for Economic Impacts

I_w

0

Importance Factor for Bridge Width

I_p

0

Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index (BSI)

57

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 07

INVENTORY DATA:			
Structure Name	<u>Boxwell Road Bridge</u>		
Main Hwy/Road #	<u> </u> On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type:	Navigable Water <input type="checkbox"/> Non- Navigable Water <input checked="" type="checkbox"/> Rail <input type="checkbox"/> Road <input checked="" type="checkbox"/> Ped <input type="checkbox"/> Other <input type="checkbox"/>
Road Name:	<u>Boxwell Road</u>		
Structure Location	<u>900 m east of grand desert road , Lot 22, Con 5 Bonfield Ontario over Sharpes Creek</u>		
Latitude	<u>46° 13' 26.0" N</u>	Longitude	<u>79° 4' 18.5" W</u>
Owner(s)	<u>Township of Bonfield</u>	Heritage Designation	Not Cons. <input checked="" type="checkbox"/> Cons./Not App. <input type="checkbox"/> List/Not Desig. <input type="checkbox"/> Desig./not List <input type="checkbox"/> Desig. & List <input type="checkbox"/>
MTO Region	<u>Northeastern</u>	Road Class:	Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<u>Sudbury</u>	Posted Speed	<u>40 km/h</u> No. of Lanes <u>1</u>
Old County	<u>Nipissing</u>	AADT	<u> </u> % Trucks <u> </u>
Geographic Twp.	<u>Bonfield</u>	Special Routes	Transit <input type="checkbox"/> Truck <input type="checkbox"/> School <input type="checkbox"/> Bicycle <input type="checkbox"/>
Structure Type	<u>Concrete Slab on Concrete Girders</u>		
Total Deck Length	<u>7.2</u> (m)	Detour Length Around Structure	<u> </u> (km)
Overall Str. Width	<u>4.6</u> (m)	Fill on Structure	<u> </u> (m)
Total Deck Area	<u>33.1</u> (m ²)	Skew Angle	<u>0</u> (Degrees)
Roadway Width	<u>4.4</u> (m)	Direction of Structure	<u>E-W</u>
Span Lengths	<u>7.2</u> (m)	No. of Spans	<u>1</u> (m)

HISTORICAL DATA			
Year Built	<u>1916</u>	Last Biennial Inspection	<u>August 7, 2020</u>
Current Load Limit	<u> </u> (tonnes)	Last Bridge Master Inspection	<u> </u>
Load Limit By-Law #	<u> </u>	Last Evaluation	<u> </u>
By-Law Expiry Date	<u> </u>	Last Underwater Inspection	<u> </u>
Min. Vertical Clearance	<u> </u> (m)	Last Condition Survey	<u> </u>
Rehabilitation History: (Date / Description)			

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 07

FIELD INSPECTION INFORMATION	
Date of Inspection:	June 03, 2022
Inspector:	Tashi Dwivedi, P.Eng., HP Engineering
Others in Party:	Nicholas Brown, HP Engineering
Equipment Used:	Digital camera, measuring tape, hammer
Weather:	Sunny
Temperature:	16 °C

ADDITIONAL INVESTIGATION REQUIRED	Priority			Estimated Cost
	None	Normal	Urgent	
Detailed Deck Condition Survey:		X		\$ 10,000.00
Bridge Rehabilitation / Replacement Study:		X		\$ 20,000.00
Detailed Coating Condition Survey:	X			\$
Underwater Investigation:	X			\$
Fatigue Investigation:	X			\$
Seismic Investigation:	X			\$
Structural Evaluation:	X			\$
Load Posting - Estimated Load			Total Cost	\$ 30,000.00

Special Notes:

A detailed deck condition survey is recommended due to the age of the structure.
 It is recommended that the bridge be replaced in the next 6 to 10 years due to the condition and vintage of structure.
 Deck barrier is substandard and should be replaced with a code compliant barrier.
 No approach barrier was present at the time of the inspection; a code compliant approach barrier and end treatments should be installed.
 Some localized medium to large potholes and settlement observed at deck ends. Concrete slope protection failed at southwest corner.

Next Detailed Inspection:	June 2024
---------------------------	-----------

Suspected Performance Deficiencies

- | | | |
|--|--|------------------------------|
| 00 None | 06 Bearing not uniformly loaded/unstable | 12 Slippery surfaces |
| 01 Load carrying capacity | 07 Jammed expansion joint | 13 Flooding/channel blockage |
| 02 Excessive deformations (deflections & rotation) | 08 Pedestrian/vehicular hazard | 14 Undermining of foundation |
| 03 Continuing settlement | 09 Rough riding surface | 15 Unstable embankments |
| 04 Continuing movements | 10 Surface ponding | 16 Other |
| 05 Seized bearings | 11 Deck drainage | |

Maintenance Needs

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

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 07

ELEMENT DATA						
Element Group:	Approaches			Length:	30 m	
Element Name:	Wearing Surface			Width:	4.4 m	
Location:	East & West of Structure			Height:	-	
Material:	Gravel			Count:	2	
Element Type:	Wearing Surface			Total Quantity:	264 m ²	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	144	100	20	09	12
Comments: Generally in fair condition with unmaintained roadway. Some localized medium to large potholes and settlement observed at deck ends.						
None <input type="checkbox"/> 1 – 5 years <input checked="" type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>						

Element Group:	Approaches			Length:	-	
Element Name:	Barrier			Width:	-	
Location:	NE, NW, SE & SW of structure			Height:	-	
Material:	-			Count:	-	
Element Type:	-			Total Quantity:	-	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m	-	-	-	-	08	-
Comments: No approach barrier present at the time of inspection. A code compliant approach barrier with end treatments should be installed.						
None <input type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input checked="" type="checkbox"/> Urgent <input type="checkbox"/>						

Element Group:	Barrier			Length:	7.2 m	
Element Name:	Parapet Wall			Width:	-	
Location:	North & South of Structure			Height:	1.05 m	
Material:	Concrete			Count:	2	
Element Type:	Cast-in-Place Concrete			Total Quantity:	14.4 m	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m	-	-	12.9	1.5	08	-
Comments: Minor to moderate scaling and discoloration/moss on surface of concrete noted. Barrier is substandard and should be replaced with a code compliant barrier.						
None <input type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input checked="" type="checkbox"/> Urgent <input type="checkbox"/>						

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 07

Element Group:	Deck	Length:	-
Element Name:	Drainage	Width:	-
Location:	North & South Side of Deck	Height:	-
Material:	Steel	Count:	4
Element Type:	Deck Drains	Total Quantity:	4
Environment:	Severe	Not Inspected:	<input type="checkbox"/>
Protection System	None		
Units	Excellent	Good	Fair
Each	-	-	2
			Poor
			2
			Performance Deficiencies
			-
			Maintenance Needs
			02
Comments:	Perforations noted at all drains and drains on north side of structure. Two drains at north are blocked with sand.		
	None <input type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input checked="" type="checkbox"/>
			Urgent <input type="checkbox"/>

Element Group:	Deck	Length:	7.2 m
Element Name:	Deck Top (Exposed)	Width:	4.6 m
Location:	Top of Deck	Height:	-
Material:	Concrete	Count:	1
Element Type:	Thick Slab	Total Quantity:	33.12 m ²
Environment:	Severe	Not Inspected:	<input checked="" type="checkbox"/>
Protection System	None		
Units	Excellent	Good	Fair
m ²	-	13.12	18.0
			Poor
			2.0
			Performance Deficiencies
			-
			Maintenance Needs
			08, 02
Comments:	Limited inspection due to gravel accumulation from approaches. Moderate scaling, concrete deterioration and small surface spalls noted on exposed sections of deck. Gravel accumulation observed on edges.		
	None <input type="checkbox"/>	1 – 5 years <input checked="" type="checkbox"/>	< 1 year <input type="checkbox"/>
			Urgent <input type="checkbox"/>

Element Group:	Decks	Length:	7.2 m
Element Name:	Soffit - Thick Slab (Exterior)	Width:	-
Location:	North & South Underside of Deck	Height:	0.2 m
Material:	Concrete	Count:	2
Element Type:	Cast-In-Place Concrete	Total Quantity:	2.88 m ²
Environment:	Moderate	Not Inspected:	<input type="checkbox"/>
Protection System	None		
Units	Excellent	Good	Fair
m ²	-	0.88	1
			Poor
			1
			Performance Deficiencies
			-
			Maintenance Needs
			08
Comments:	Large spalls with exposed corroded reinforcement observed on north and south fascia.		
	None <input type="checkbox"/>	1 – 5 years <input checked="" type="checkbox"/>	< 1 year <input type="checkbox"/>
			Urgent <input type="checkbox"/>

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 07

Element Group:	Decks	Length:	7.2 m				
Element Name:	Soffit - Thick Slab (Interior)	Width:	4.6 m				
Location:	Underside of Deck	Height:	-				
Material:	Concrete	Count:	1				
Element Type:	Cast-In-Place Concrete	Total Quantity:	33.12 m ²				
Environment:	Moderate	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	28.12	4	1	-	08	
Comments: Light scaling and honeycombing. Some spalls with efflorescence noted.							
None <input type="checkbox"/> 1 – 5 years <input checked="" type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>							

Element Group:	Beams/MLE's	Length:	7.2 m				
Element Name:	Girders	Width:	0.25 m				
Location:	Underside of Deck	Height:	0.25 m				
Material:	Concrete	Count:	4				
Element Type:	Girder	Total Quantity:	21.6 m ²				
Environment:	Moderate	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	15.6	3	3	-	08	
Comments: Moderate scaling and spalls with exposed corroded reinforcement noted.							
None <input type="checkbox"/> 1 – 5 years <input checked="" type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>							

Element Group:	Beams/MLE's	Length:	1.2 m				
Element Name:	Diaphragms	Width:	0.25 m				
Location:	Underside of Deck	Height:	0.2 m				
Material:	Concrete	Count:	3				
Element Type:	Diaphragm	Total Quantity:	2.52 m ²				
Environment:	Benign	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	2.27	0.25	-	-	-	
Comments: Light to moderate scaling.							
None <input checked="" type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>							

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 07

Element Group:	Abutments	Length:	1.75 m				
Element Name:	Wingwalls	Width:	-				
Location:	NE, NW, SE, & SW of Structure	Height:	1 m				
Material:	Concrete	Count:	4				
Element Type:	Cast-in-Place Concrete	Total Quantity:	7 m ²				
Environment:	Benign	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	3	2	2	-	08	
Comments:	Generally in good condition with minor scaling, narrow cracks and efflorescence. Area of concrete deterioration observed on northwest wingwall. Undermining observed on southwest wingwall.						
	None <input type="checkbox"/>	1 – 5 years <input checked="" type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>			

Element Group:	Abutments	Length:	4.6 m				
Element Name:	Abutment Walls	Width:	-				
Location:	East & West Underside of Structure	Height:	1 m				
Material:	Concrete	Count:	2				
Element Type:	Cast-in-Place Concrete	Total Quantity:	9.2 m ²				
Environment:	Benign	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	5.6	2.6	1.0	-	08	
Comments:	Moderate scaling, narrow longitudinal cracks and efflorescence noted on abutment walls. Concrete footings have narrow transverse cracks, minor undermining, and spalls at northeast corner. Some exposed rebar on east footing was also noted.						
	None <input type="checkbox"/>	1 – 5 years <input checked="" type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>			

Element Group:	Foundations	Length:	-				
Element Name:	Foundations (below ground level)	Width:	-				
Location:	-	Height:	-				
Material:	-	Count:	-				
Element Type:	Unknown	Total Quantity:	-				
Environment:	Benign	Not Inspected:	<input type="checkbox"/>				
Protection System	-					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
N/A	-	-	-	-	-	-	
Comments:	No evidence of instability.						
	None <input checked="" type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>			

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 07

Element Group:	Embankment and Streams	Length:	-				
Element Name:	Embankments	Width:	-				
Location:	NE, NW, SE, & SW of Structure	Height:	-				
Material:	Native	Count:	-				
Element Type:	Embankment	Total Quantity:	-				
Environment:	Benign	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
%	-	100	-	-	-	-	
Comments:	Moderately sloped, well vegetated and appear stable. Concrete slope protection failed at southwest corner.						
	None <input checked="" type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>			

Element Group:	Embankment and Streams	Length:	-				
Element Name:	Streams and Waterways	Width:	-				
Location:	Under Roadway	Height:	-				
Material:	Native	Count:	-				
Element Type:	Stream	Total Quantity:	-				
Environment:	Benign	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
All	-	All	-	-	-	-	
Comments:	Moderate volume and high flow from south to north observed at the time inspection.						
	None <input checked="" type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>			

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 07

REPAIR AND REHABILITATION REQUIRED		Priority			Estimated Cost
Element	Repair and Rehabilitation Required	6 - 10 Years	1 - 5 Years	< 1 year	
Approaches	Install guiderail			X	\$ -
Deck & Girders	Concrete repairs to deck top, Abutment walls, deck soffit, & girders		X		\$ -
Structure	Replacement	X			\$ 354,000.00
					\$ -
					\$ -
					\$ -
					\$ -
					\$ -
					\$ -
Total Cost					\$ 354,000.00

ASSOCIATED WORK	Comments	Estimated Cost
Approaches		
Detours		\$ 100,000.00
Traffic Control		\$ 60,000.00
Utilities		
Right of Way		
Environmental Study		\$ 10,000.00
Other		
Contingencies		
Total Cost		\$ 170,000.00

JUSTIFICATION

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 1 Structure from east approach



Photo 2 Structure from west approach

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 3 East approach from centre of structure



Photo 4 West approach from centre of structure

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 5 North elevation



Photo 6 South elevation

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 7 Large potholes on east approach.



Photo 8 Moderate scaling, small spalls and dirt accumulation on exposed deck top.

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 9 Light to moderate scaling and discoloration noted on parapet wall



Photo 10 Large spall with exposed corroded reinforcing on north fascia.

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 11 Spalls with exposed corroded reinforcement on face of exterior girder



Photo 12 Corrosion and perforation noted at deck drain (Typical)

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 13 Typical east underside of structure



Photo 14 Spall with exposed corroded reinforcing steel on abutment wall

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 15 Moderate scaling and efflorescence stains noted on abutment wall



Photo 16 Severe scaling on ballast wall and cracks with efflorescence noted on deck soffit

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 7



Photo 17 Spall and longitudinal cracks noted on girders



Photo 18 Concrete slope protection at southwest corner failed

Structure Condition Summary Form

Structure Name Trunk Road Bridge
Structure Number 08
Date of Inspection June 03, 2022
Project No. 22035
Consultant HP Engineering Inc.

Element Group	Element Name	Unit (Qty.)	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition (1.00)	Element Quantity in Good Condition (0.75)	Element Quantity in Fair Condition (0.4)	Element Quantity in Poor Condition (0)	Total Replacement Value (TRV)	Current Element Value (CEV)	Element Condition Index	Performance Deficiency	Maintenance Need
Abutment	Abutment Walls	Sq.m	900.00	26.40	0.00	6.60	13.20	6.60	23760	9207	39	01	00
	Wingwalls	Sq.m	350.00	9.90	0.00	0.00	4.95	4.95	3465	693	20	01	00
Approaches	Wearing Surface	Sq.m	6.00	360.00	0.00	240.00	70.00	50.00	2160	1248	58	09	00
Barriers	Barrier/ Parapet Walls	Sq.m	100.00	8.00	0.00	0.00	0.00	8.00	800	0		08	00
Decks	Deck Top - Thick Slab	Sq.m	350.00	19.80	0.00	11.80	5.00	3.00	6930	3798	55	00	02, 08
	Soffit - Thick Slab	Sq.m	350.00	24.00	0.00	0.00	12.00	12.00	8400	1680	20	00	08

45515
16626

Bridge Condition Index (BCI) 37

- I_t 0 Importance Factor for Traffic
- I_c 0 Importance Factor for Economic Impacts
- I_w 0 Importance Factor for Bridge Width
- I_p 0 Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index (BSI) 37

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 08

INVENTORY DATA:			
Structure Name	<u>Trunk Road Bridge</u>		
Main Hwy/Road #	<u> </u> On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type:	Navigable Water <input type="checkbox"/> Non- Navigable Water <input checked="" type="checkbox"/> Rail <input type="checkbox"/> Road <input checked="" type="checkbox"/> Ped <input type="checkbox"/> Other <input type="checkbox"/>
Road Name:	<u>Trunk Road</u>		
Structure Location	<u>1.1 km east of trout pond road , Lot 23, Con 9 Bonfield Ontario over Blueseal Creek</u>		
Latitude	<u>46° 15' 26.0" N</u>	Longitude	<u>79° 5' 7.6" W</u>
Owner(s)	<u>Township of Bonfield</u>	Heritage Designation	Not Cons. <input checked="" type="checkbox"/> Cons./Not App. <input type="checkbox"/> List/Not Desig. <input type="checkbox"/> Desig./not List <input type="checkbox"/> Desig. & List <input type="checkbox"/>
MTO Region	<u>Northeastern</u>	Road Class:	Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<u>Sudbury</u>	Posted Speed	<u> </u> No. of Lanes <u>1</u>
Old County	<u>Nipissing</u>	AADT	<u> </u> % Trucks <u> </u>
Geographic Twp.	<u>Bonfield</u>	Special Routes	Transit <input type="checkbox"/> Truck <input checked="" type="checkbox"/> School <input checked="" type="checkbox"/> Bicycle <input checked="" type="checkbox"/>
Structure Type	<u>Concrete Slab</u>	Detour Length Around Structure	<u> </u> (km)
Total Deck Length	<u>3.6</u> (m)	Fill on Structure	<u> </u> (m)
Overall Str. Width	<u>6.0</u> (m)	Skew Angle	<u>0</u> (Degrees)
Total Deck Area	<u>21.6</u> (m ²)	Direction of Structure	<u>E-W</u>
Roadway Width	<u>5.5</u> (m)	No. of Spans	<u>1</u> (m)
Span Lengths	<u>3.6</u> (m)		

HISTORICAL DATA			
Year Built	<u>1930 (est)</u>	Last Biennial Inspection	<u>August 6, 2020</u>
Current Load Limit	<u> </u> (tonnes)	Last Bridge Master Inspection	<u> </u>
Load Limit By-Law #	<u> </u>	Last Evaluation	<u> </u>
By-Law Expiry Date	<u> </u>	Last Underwater Inspection	<u> </u>
Min. Vertical Clearance	<u> </u> (m)	Last Condition Survey	<u> </u>
Rehabilitation History: (Date / Description)			

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 08

FIELD INSPECTION INFORMATION	
Date of Inspection:	June 03, 2022
Inspector:	Tashi Dwivedi, P.Eng., HP Engineering
Others in Party:	Nicholas Brown, HP Engineering
Equipment Used:	Digital camera, measuring tape, hammer
Weather:	Overcast
Temperature:	22 °C

ADDITIONAL INVESTIGATION REQUIRED	Priority			Estimated Cost
	None	Normal	Urgent	
Detailed Deck Condition Survey:	X			\$ 5,000.00
Bridge Rehabilitation / Replacement Study:		X		\$ 20,000.00
Detailed Coating Condition Survey:	X			\$
Underwater Investigation:	X			\$
Fatigue Investigation:	X			\$
Seismic Investigation:	X			\$
Structural Evaluation:		X		\$ 10,000.00
Load Posting - Estimated Load			Total Cost	\$ 35,000.00

Special Notes:

Due to the vintage and condition of the structure, it is recommended a detailed deck condition survey and a rehabilitation / replacement study be performed for load posting and that the structure be replaced in 1 – 5 years. The structural evaluation is to calculate a load posting for the current state of the structure. A code compliant approach barrier should be installed. The deck barrier is missing 2 posts and exposed corroded reinforcement is observed throughout. A code compliant deck barrier should be installed. Spalls with exposed corroded reinforcement and delaminations throughout deck soffit.

Next Detailed Inspection:	June 2024
---------------------------	-----------

Suspected Performance Deficiencies

- | | | |
|--|--|------------------------------|
| 00 None | 06 Bearing not uniformly loaded/unstable | 12 Slippery surfaces |
| 01 Load carrying capacity | 07 Jammed expansion joint | 13 Flooding/channel blockage |
| 02 Excessive deformations (deflections & rotation) | 08 Pedestrian/vehicular hazard | 14 Undermining of foundation |
| 03 Continuing settlement | 09 Rough riding surface | 15 Unstable embankments |
| 04 Continuing movements | 10 Surface ponding | 16 Other |
| 05 Seized bearings | 11 Deck drainage | |

Maintenance Needs

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

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 08

ELEMENT DATA						
Element Group:	Approaches			Length:	-	
Element Name:	Barrier			Width:	-	
Location:	NE, NW, SE, & SW of Structure			Height:	-	
Material:	-			Count:	-	
Element Type:	-			Total Quantity:	-	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	-				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
-	-	-	-	-	08	-
Comments: No approach barrier was present at the time of inspection; a code compliant barrier with end treatments should be installed.						
None <input type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input checked="" type="checkbox"/> Urgent <input type="checkbox"/>						

Element Group:	Approaches			Length:	30 m	
Element Name:	Wearing Surface			Width:	6 m	
Location:	East & West of Structure			Height:	-	
Material:	Surface Treatment			Count:	2	
Element Type:	Wearing Surface			Total Quantity:	360 m ²	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	240	70	50	09	-
Comments: Patched potholes on west approach where a pothole had been previously patched and light to moderate ravelling observed. Patches and potholes observed on both approaches. Patched areas appear to be depressed.						
None <input type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input checked="" type="checkbox"/> Urgent <input type="checkbox"/>						

Element Group:	Accessories			Length:	-	
Element Name:	Signs			Width:	-	
Location:	NE, NW, SE, & SW of Structure			Height:	-	
Material:	Steel			Count:	4	
Element Type:	Hazard signs			Total Quantity:	4	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	Hot-Dip Galvanized				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
Each	-	-	4	-	-	-
Comments: Localized damages on all signs. Southeast and southwest hazard sign leaning slightly away from roadway.						
None <input checked="" type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>						

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 08

Element Group:	Barrier	Length:	4 m				
Element Name:	Parapet Wall	Width:	-				
Location:	North & South Sides of Structure	Height:	1m				
Material:	Concrete	Count:	2				
Element Type:	Cast-in-Place Concrete	Total Quantity:	8 m ²				
Environment:	Moderate	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	-	-	8	08	-	
Comments:	Medium map cracks, efflorescence, damp stains, exposed corroded reinforcement and narrow to large cracks throughout. Two missing left posts with steel placed in front at north. End post at south was detached. Top rail at northwest corner was not present at the time of inspection. Barrier is substandard and should be replaced with a code compliant barrier.						
	None <input type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input checked="" type="checkbox"/>	Urgent <input type="checkbox"/>			

Element Group:	Deck	Length:	-				
Element Name:	Drainage System	Width:	-				
Location:	North & South of Structure	Height:	-				
Material:	Steel	Count:	4				
Element Type:	Metal Drainpipes	Total Quantity:	4				
Environment:	Severe	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
Each	-	-	3	1	-	02	
Comments:	Generally in good condition. One deck drains covered by gravel/sand.						
	None <input type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input checked="" type="checkbox"/>	Urgent <input type="checkbox"/>			

Element Group:	Deck	Length:	3.6 m				
Element Name:	Deck Top	Width:	5.5 m				
Location:	Top of Deck (Exposed)	Height:	-				
Material:	Concrete	Count:	1				
Element Type:	Cast-in-Place Concrete	Total Quantity:	19.8 m ²				
Environment:	Severe	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	11.8	5	3	-	02,08	
Comments:	Minor scaling and medium cracks were observed. Some debris accumulation noted. Spalls, medium to wide cracks with gravel accumulation noted on sides.						
	None <input type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input checked="" type="checkbox"/>	Urgent <input type="checkbox"/>			

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 08

Element Group:	Decks			Length:	4 m	
Element Name:	Soffit - Thick Slab (Exterior)			Width:	0.3 m	
Location:	Underside of Structure			Height:	-	
Material:	Concrete			Count:	2	
Element Type:	Cast-In-Place Concrete			Total Quantity:	2.4 m ²	
Environment:	Moderate			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	-	1.2	1.2	-	08
Comments:	Narrow crack with damp and rust stains noted on north fascia. Some severe localized efflorescence observed on south fascia. Large area of deterioration noted at south.					
	None <input type="checkbox"/>	1 – 5 years <input checked="" type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>		

Element Group:	Decks			Length:	3.6 m	
Element Name:	Soffit - Thick Slab (Interior)			Width:	6.0 m	
Location:	Underside of Structure			Height:	-	
Material:	Concrete			Count:	1	
Element Type:	Cast-In-Place Concrete			Total Quantity:	21.6 m ²	
Environment:	Moderate			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	-	10.8	10.8	-	-
Comments:	Spalls with exposed corroded reinforcement and severe delamination observed throughout soffit. Efflorescence, damp stains and narrow longitudinal and transverse cracks noted on fascias.					
	None <input type="checkbox"/>	1 – 5 years <input checked="" type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>		

Element Group:	Abutments			Length:	1.65 m	
Element Name:	Wingwalls			Width:	-	
Location:	NE, NW, SE, SW of Structure			Height:	1.5 m	
Material:	Concrete			Count:	4	
Element Type:	Cast-In-Place Concrete			Total Quantity:	9.9 m ²	
Environment:	Benign			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	-	4.95	4.95	01	-
Comments:	Narrow cracks and efflorescence at north wingwalls. Some wide cracks at both wingwalls were also noted.					
	None <input type="checkbox"/>	1 – 5 years <input checked="" type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>		

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 08

Element Group:	Abutments			Length:	6 m	
Element Name:	Abutment Walls			Width:	-	
Location:	East & West Underside of Structure			Height:	2.2 m	
Material:	Concrete			Count:	2	
Element Type:	Cast-In-Place Concrete			Total Quantity:	26.4 m ²	
Environment:	Benign			Not Inspected:	■	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	6.6	13.2	6.6	01	-
Comments:	Medium to wide crack with efflorescence. Some Moderate scaling was also noted. Limited inspection due to high water levels. Wide vertical cracks noted. Spall observed on haunches.					
	None <input type="checkbox"/>	1 – 5 years <input checked="" type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>		

Element Group:	Foundations			Length:	-	
Element Name:	Foundations (below ground level)			Width:	-	
Location:	-			Height:	-	
Material:	-			Count:	2	
Element Type:	Unknown			Total Quantity:	2	
Environment:	Benign			Not Inspected:	<input type="checkbox"/>	
Protection System	-				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
each	-	-	-	-	01	-
Comments:	Unable to confirm condition due to high water levels Large spalls noted on east footing. Displacement observed at northeast corner of footing.					
	None <input checked="" type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>		

Element Group:	Embankment and Streams			Length:	-	
Element Name:	Embankments			Width:	-	
Location:	NE, NW, SE, SW of Structure			Height:	-	
Material:	Native			Count:	-	
Element Type:	Embankment			Total Quantity:	-	
Environment:	Benign			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
%	-	100	-	-	-	-
Comments:	Moderate slope, well vegetated and appear stable. Wide crack noted at southeast wingwall and abutment.					
	None <input checked="" type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>		

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 08

Element Group:	Embankment and Streams			Length:	-	
Element Name:	Streams and Waterways			Width:	-	
Location:	Under Roadway			Height:	-	
Material:	Native			Count:	-	
Element Type:	Stream			Total Quantity:	all	
Environment:	Benign			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
all	-	all	-	-	-	18
Comments: Low volume, low flow with some branches blocking the waterways.						
None <input type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input checked="" type="checkbox"/> Urgent <input type="checkbox"/>						

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 08

REPAIR AND REHABILITATION REQUIRED		Priority			Estimated Cost
Element	Repair and Rehabilitation Required	6 – 10 Years	1 - 5 Years	< 1 year	
Approaches	Install guiderail			X	\$ -
Barrier	Install code compliant traffic barrier			X	\$ -
Structure	Replace Structure		X		\$ 239,000.00
					\$ -
					\$ -
					\$ -
					\$ -
					\$ -
					\$ -
Total Cost					\$ 239,000.00

ASSOCIATED WORK	Comments	Estimated Cost
Approaches		
Detours		\$ 100,000.00
Traffic Control		\$ 60,000.00
Utilities		
Right of Way		
Environmental Study		\$ 10,000.00
Other		
Contingencies		
Total Cost		\$ 170,000.00

JUSTIFICATION

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 08



Photo 1 Structure from east approach



Photo 2 Structure from west approach

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 08



Photo 3 East approach from centre of structure



Photo 4 West approach from centre of structure

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 08



Photo 5 North elevation



Photo 6 South elevation

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 08



Photo 7 Asphalt patches and small pothole on west approach wearing surface



Photo 8 Exposed corroded reinforcement and steel beam on barrier

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 08



Photo 9 Severe spall and cracks with efflorescence noted on south fascia



Photo 10 Spalls with exposed corroded reinforcement and severe delamination on soffit.

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 08



Photo 11 Minor scaling, medium spall and debris noted on deck top



Photo 12 Narrow cracks with efflorescence noted on northwest wingwall.

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 08



Photo 13 Medium crack with efflorescence observed on abutment wall



Photo 14 Small spall and longitudinal cracks noted at haunches

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

SITE PHOTOGRAPHS

Site No.: 08



Photo 15 Large spall with crack noted on southeast wingwall



Photo 16 Moderate scaling, narrow cracks with efflorescence noted on west abutment wall

Structure Condition Summary Form

Structure Name Pine Lake Road Bridge
Structure Number 10
Date of Inspection June 03, 2022
Project No. 22035
Consultant HP Engineering Inc.

Element Group	Element Name	Unit (Qty.)	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition (1.00)	Element Quantity in Good Condition (0.75)	Element Quantity in Fair Condition (0.4)	Element Quantity in Poor Condition (0)	Total Replacement Value (TRV)	Current Element Value (CEV)	Element Condition Index	Performance Deficiency	Maintenance Need
Abutment	Abutment Walls	Sq.m	900.00	115.53	0.00	114.53	1.00	0.00	103977	77668	75	00	02
	Wingwalls	Sq.m	350.00	182.44	0.00	177.44	5.00	0.00	63854	47278	74	00	00
Approaches	Wearing Surface	Sq.m	6.00	104.40	0.00	46.20	52.20	6.00	626	333	53	00	02, 12
Barriers	Posts - Timber	Each	50.00	30.00	0.00	23.00	7.00	0.00	1500	1003	67	08	00
	Railing Systems	m	200.00	26.00	0.00	18.00	4.00	4.00	5200	3020	58	08	00
Decks	Deck Top - Thick Slab	Sq.m	350.00	115.54	0.00	0.00	115.54	0.00	40439	16176	40	00	00
	Soffit-Inside Boxes	Sq.m	125.00	128.82	0.00	123.82	5.00	0.00	16103	11858	74	00	00
	Wearing Surface	Sq.m	25.00	115.54	0.00	50.54	55.00	10.00	2889	1498	52	09	12

234587

158833

Bridge Condition Index (BCI)

68

I_t

0

Importance Factor for Traffic

I_c

0

Importance Factor for Economic Impacts

I_w

0

Importance Factor for Bridge Width

I_p

0

Importance Factor for Bridge Profile or Alignment

Bridge Sufficiency Index (BSI)

68

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 10

INVENTORY DATA:			
Structure Name	<u>Pine Lake Road Bridge</u>		
Main Hwy/Road #	<u> </u> On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type:	Navigable Water <input type="checkbox"/> Non- Navigable Water <input checked="" type="checkbox"/> Rail <input type="checkbox"/> Road <input checked="" type="checkbox"/> Ped <input type="checkbox"/> Other <input type="checkbox"/>
Road Name:	<u>Pine Lake Road</u>		
Structure Location	<u>Lot 31, Con 9 Bonfield Ontario over Sheedy Lake, 1.35 m north of highway 17</u>		
Latitude	<u> </u>	Longitude	<u> </u>
Owner(s)	<u>Township of Bonfield</u>	Heritage Designation	Not Cons. <input checked="" type="checkbox"/> Cons./Not App. <input type="checkbox"/> List/Not Desig. <input type="checkbox"/> Desig./not List <input type="checkbox"/> Desig. & List <input type="checkbox"/>
MTO Region	<u>Northeastern</u>	Road Class:	Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<u>Sudbury</u>	Posted Speed	<u> </u> No. of Lanes <u> </u> 2
Old County	<u>Nipissing</u>	AADT	<u> </u> % Trucks <u> </u>
Geographic Twp.	<u>Bonfield</u>	Special Routes	Transit <input type="checkbox"/> Truck <input checked="" type="checkbox"/> School <input checked="" type="checkbox"/> Bicycle <input checked="" type="checkbox"/>
Structure Type	<u>Concrete Rigid Frame</u>	Detour Length Around Structure	<u> </u> (km)
Total Deck Length	<u> </u> 13.28 (m)	Fill on Structure	<u> </u> (m)
Overall Str. Width	<u> </u> 9.7 (m)	Skew Angle	<u> </u> 0 (Degrees)
Total Deck Area	<u> </u> 128.82 (m ²)	Direction of Structure	<u> </u> N-S
Roadway Width	<u> </u> 8.7 (m)	No. of Spans	<u> </u> 1 (m)
Span Lengths	<u> </u> 13.28 (m)		

HISTORICAL DATA			
Year Built	<u> </u> 1983	Last Biennial Inspection	<u> </u> August 6, 2020
Current Load Limit	<u> </u> (tonnes)	Last Bridge Master Inspection	<u> </u>
Load Limit By-Law #	<u> </u>	Last Evaluation	<u> </u>
By-Law Expiry Date	<u> </u>	Last Underwater Inspection	<u> </u>
Min. Vertical Clearance	<u> </u> (m)	Last Condition Survey	<u> </u>
Rehabilitation History: (Date / Description)			

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 10

FIELD INSPECTION INFORMATION	
Date of Inspection:	June 03, 2022
Inspector:	Tashi Dwivedi, P.Eng., HP Engineering
Others in Party:	Nicholas Brown, HP Engineering
Equipment Used:	Digital camera, measuring tape, hammer
Weather:	Overcast
Temperature:	22 °C

ADDITIONAL INVESTIGATION REQUIRED	Priority			Estimated Cost
	None	Normal	Urgent	
Detailed Deck Condition Survey:		X		\$ 10,000.00
Bridge Rehabilitation / Replacement Study:		X		\$ 5,000.00
Detailed Coating Condition Survey:	X			\$
Underwater Investigation:	X			\$
Fatigue Investigation:	X			\$
Seismic Investigation:	X			\$
Structural Evaluation:	X			\$
Load Posting - Estimated Load			Total Cost	\$ 15,000.00

Special Notes:

Rehabilitation/replacement study is for traffic barrier only.
 A detailed deck condition survey is recommended due to the age of the structure.

Some collision damage was noted on southeast and southwest approach barriers. Adequacy of deck barrier should be verified. Approach barrier end treatments are substandard and should be replaced with code compliant end treatment. Hazard signs should be installed. Medium to wide longitudinal and transverse cracks noted in approach and deck wearing surface.

Next Detailed Inspection:	June 2024
---------------------------	-----------

Suspected Performance Deficiencies

- | | | |
|--|--|------------------------------|
| 00 None | 06 Bearing not uniformly loaded/unstable | 12 Slippery surfaces |
| 01 Load carrying capacity | 07 Jammed expansion joint | 13 Flooding/channel blockage |
| 02 Excessive deformations (deflections & rotation) | 08 Pedestrian/vehicular hazard | 14 Undermining of foundation |
| 03 Continuing settlement | 09 Rough riding surface | 15 Unstable embankments |
| 04 Continuing movements | 10 Surface ponding | 16 Other |
| 05 Seized bearings | 11 Deck drainage | |

Maintenance Needs

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

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 10

ELEMENT DATA						
Element Group:	Approaches			Length:	17 m	
Element Name:	Barrier			Width:	-	
Location:	North & South of Structure			Height:	-	
Material:	Steel			Count:	2	
Element Type:	Steel Flex Beam on Wood Post			Total Quantity:	34 m	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	Hot-Dip Galvanized				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m	-	28	3	3	08	-
Comments:	Localized rust on steel and few checks on wood posts. Some damage was also noted on southeast and southwest approach barriers. Existing buried end treatments are substandard and should be replaced with code compliant end treatment. Hazard signs should be installed at guiderail ends.					
None	<input type="checkbox"/>	1 – 5 years	<input type="checkbox"/>	< 1 year	<input checked="" type="checkbox"/>	Urgent <input type="checkbox"/>

Element Group:	Approaches			Length:	6 m	
Element Name:	Wearing Surface			Width:	8.7 m	
Location:	North & South of Structure			Height:	-	
Material:	Asphalt			Count:	2	
Element Type:	Wearing Surface			Total Quantity:	104.4 m ²	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	46.2	52.2	6	-	02, 12
Comments:	Medium to wide longitudinal and transverse cracks. Light to moderate ravelling and abrasion noted throughout and sunken pavement at the east side of the north approach. Potholes observed on the north approach. Sand builds up at edge of roadway.					
None	<input type="checkbox"/>	1 – 5 years	<input checked="" type="checkbox"/>	< 1 year	<input type="checkbox"/>	Urgent <input type="checkbox"/>

Element Group:	Barrier			Length:	13 m	
Element Name:	Railing System			Width:	-	
Location:	East & West side of Structure			Height:	-	
Material:	Steel			Count:	2	
Element Type:	Traffic Barrier			Total Quantity:	26 m	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	Paint				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m	-	18	4	4	08	-
Comments:	Localized rust and some collision damage noted on east end west barrier. Barrier adequacy over structure should be verified to ensure it meets current standards.					
None	<input type="checkbox"/>	1 – 5 years	<input type="checkbox"/>	< 1 year	<input checked="" type="checkbox"/>	Urgent <input type="checkbox"/>

MUNICIPAL STRUCTURE INSPECTION FORM

BRIDGE

Site No.: 10

Element Group:	Barrier			Length:	-	
Element Name:	Barrier post			Width:	-	
Location:	East & West side of Structure			Height:	-	
Material:	Timber			Count:	30	
Element Type:	Timber posts			Total Quantity:	30	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	Paint				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
each	-	23	7	-	08	-
Comments: Generally in good condition with a few checks and moderate rotting on wood posts.						
None <input type="checkbox"/> 1 – 5 years <input checked="" type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>						

Element Group:	Deck			Length:	13.28 m	
Element Name:	Wearing Surface			Width:	8.7 m	
Location:	Top of Deck			Height:	-	
Material:	Asphalt			Count:	1	
Element Type:	Wearing Surface			Total Quantity:	115.54 m ²	
Environment:	Severe			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	50.54	55	10	09	12
Comments: Medium to wide longitudinal and transverse cracks, map cracks and abrasion noted throughout.						
None <input type="checkbox"/> 1 – 5 years <input checked="" type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>						

Element Group:	Decks			Length:	13.28 m	
Element Name:	Soffit - Thick Slab (exterior)			Width:	-	
Location:	Underside of Structure			Height:	0.4 m	
Material:	Concrete			Count:	2	
Element Type:	Cast-In-Place Concrete			Total Quantity:	10.63 m ²	
Environment:	Moderate			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
m ²	-	10.63	-	-	-	-
Comments: Some localized efflorescence noted near abutment walls.						
None <input checked="" type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>						

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Element Group:	Decks	Length:	13.28 m				
Element Name:	Soffit - Thick Slab (Interior)	Width:	9.7 m				
Location:	Underside of Structure	Height:	-				
Material:	Concrete	Count:	1				
Element Type:	Cast-In-Place Concrete	Total Quantity:	128.82 m ²				
Environment:	Moderate	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	123.82	5	-	-	-	
Comments:	Narrow cracks and previously patched spalls noted on soffit. Some damp stains also noted near both abutment walls. Stalactites noted on near the abutment walls.						
	None <input checked="" type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>			

Element Group:	Abutments	Length:	7.5 m				
Element Name:	Wingwalls	Width:	-				
Location:	NE, NW, SE, & SW of Structure	Height:	6.31 m (N), 5.6 m (S)				
Material:	Concrete	Count:	4				
Element Type:	Cast-In-Place Concrete	Total Quantity:	182.44 m ²				
Environment:	Moderate	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	177.44	5	-	-	-	
Comments:	Minor sealing, efflorescence and narrow horizontal cracks noted.						
	None <input checked="" type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>			

Element Group:	Abutments	Length:	9.7 m				
Element Name:	Abutment Walls	Width:	-				
Location:	North & South of Structure	Height:	6.31 m (N), 5.6 m (S)				
Material:	Concrete	Count:	2				
Element Type:	Cast-In-Place Concrete	Total Quantity:	115.53 m ²				
Environment:	Moderate	Not Inspected:	<input type="checkbox"/>				
Protection System	None					Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor			
m ²	-	114.53	1	-	-	02	
Comments:	Narrow full height vertical crack observed at centre drainage hole of both abutment walls and water stains at the edges of abutment walls. Some graffiti are also present on walls.						
	None <input type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input checked="" type="checkbox"/>	Urgent <input type="checkbox"/>			

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Site No.: 10

Element Group:	Foundations			Length:	-	
Element Name:	Foundations (below ground level)			Width:	-	
Location:	-			Height:	-	
Material:	-			Count:	-	
Element Type:	Unknown			Total Quantity:	-	
Environment:	Benign			Not Inspected:	<input checked="" type="checkbox"/>	
Protection System	-				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
N/A	-	-	-	-	-	-
Comments: No visible evidence of foundation instability observed at time of inspection.						
None <input checked="" type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>						

Element Group:	Embankment and Streams			Length:	-	
Element Name:	Embankments			Width:	-	
Location:	NE, NW, N, SE, SW, & S of Structure			Height:	-	
Material:	Native			Count:	6	
Element Type:	Embankment			Total Quantity:	6	
Environment:	Benign			Not Inspected:	<input type="checkbox"/>	
Protection System	Rock Protection				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
each	-	6	-	-	-	-
Comments: Moderately sloped, well vegetated and appear stable. Rock slope protection was observed at the embankments in front of the north and south abutments.						
None <input checked="" type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>						

Element Group:	Embankment and Streams			Length:	-	
Element Name:	Slope Protection			Width:	-	
Location:	North & South Underside of Structure			Height:	-	
Material:	Rocks			Count:	2	
Element Type:	Slope Protection			Total Quantity:	2	
Environment:	Benign			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
each	-	2	-	-	-	-
Comments: Slope protection in good condition.						
None <input checked="" type="checkbox"/> 1 – 5 years <input type="checkbox"/> < 1 year <input type="checkbox"/> Urgent <input type="checkbox"/>						

MUNICIPAL STRUCTURE INSPECTION FORM

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Site No.: 10

Element Group:	Embankment and Streams			Length:	-	
Element Name:	Streams and Waterways			Width:	-	
Location:	Under Roadway			Height:	-	
Material:	Native			Count:	-	
Element Type:	Stream			Total Quantity:	-	
Environment:	Benign			Not Inspected:	<input type="checkbox"/>	
Protection System	None				Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair	Poor		
%	-	100	-	-	-	-
Comments:	Medium volume and high flow from west to east with no visible flow obstructions noted in the stream at the time of inspection.					
	None <input checked="" type="checkbox"/>	1 – 5 years <input type="checkbox"/>	< 1 year <input type="checkbox"/>	Urgent <input type="checkbox"/>		