AGENDA FOR THE COUNCIL MEETING OF THE CORPORATION OF THE TOWNSHIP OF RED ROCK FOR THE 987th REGULAR MEETING ON JULY 17th, 2023 AT 6:30 P.M.

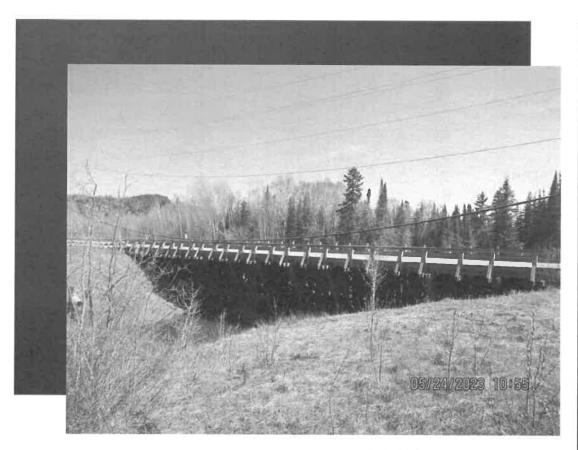
1.	Closed Sessio	on (6:30pm)	
	Item 1.1:	Resolution to enter Closed Session, as authorized by the Municipal Act, 2001. Such paragraphs as set out in the minutes for the purpose of approval of the Closed Session minutes of the meeting held on June 19, 2023 (Item 1.2); and	RES
		Paragraph 239(2)(b) (identifiable individual), regarding Item 1.3; and Paragraph 239(2)(c) (proposed or pending acquisition or disposition of land), regarding Item 1.4	
	Item 1.2:	Minutes of the Closed Session portion of the regular Council Meeting held June 19, 2023	RES
	Item 1.3:	Report on Personnel Matters	
	Item 1.4:	Report on Acquisition/Disposition of Land	
	Item 1.5:	Resolution to Rise from Closed Session and Report in Open Session	RES
2.	Report from (Closed Session	
3.	Preliminary N	Matters:	
	Item 3.1:		
	Item 3.2:	Traditional Territory Acknowledgement & Moment of Silence	
	Item 3.3:	Amendments to/Acceptance of Agenda	RES
	Item 3.4:	Request/Receive Disclosures of Interest	
4.		or Deputations	
	Item 4.1:	JML Engineering – Bi-Annual Inspection	RES
	Item 4.2:	BDO – 2022 Audited Financial Statements	RES
5.	Minutes of Pr	revious Council Meeting(s)	
	Item 5.1:	Minutes of the June 19, 2023 Council Meeting	RES
6.	Corresponder	nce	
	Item 6.1:	Resolutions from other Municipalities	RES
	Item 6.2:	Red Rock Fish & Game Club – Thank You Letter	
	Item 6.3:	TBDHU – May 17, 2023 Board Meeting Minutes	
	Item 6.4:	Red Rock Committee of Adjustment Notice	
	Item 6.5:	NOMA – June 20, 2023 Board Meeting Summary	
	Item 6.6:	TBDSSAB – Update from the Board	
	Item 6.7:	Government of Canada – Boreal Caribou Conservation Timeline	
	Item 6.8: Item 6.9:	TBDSSAB – May 18, 2023 Open & Closed Session Minutes SNEMS – Nipigon/Red Rock Consolidation Engagement Meeting	
-	D 4 C		
1.	Reports from	Committees, Boards or Agencies	
8.	-	Administration	
	Item 8.1:	Report from Director of Operations	RES
	Item 8.2:	Report from Community Development Office	RES (2)
	Item 8.3:	Report on Administrative Activity	RES

9. By-laws

- 10. New Business
- 11. Unfinished Business
- 12. Closed Session (if required)
- 13. Report from Closed Session
- 14. Confirming By-law (#2023-1331)

15. Adjournment

RES





Bi-annual Inspection Four Bridges One Culvert

FOR THE TOWNSHIP OF RED ROCK



Ref. No. JML2023013

May 2023



105 Villa Street, 2nd Floor Thunder Bay, ON P7A7W5 Phone: 807.345.1131 Fay: 807.345.1220

Fax: 807.345.1229 Email: info@jmleng.com

June 2, 2023 Ref. No. JML2023013

The Corporation of the Township of Red Rock Box 447, 42 Salls Street Red Rock, ON POT 2P0

Attention: Blair Westerman

Public Works Superintendent

Reference: Bi-Annual Inspection Four Bridges One Culvert

Dear Blair:

JML Engineering has been retained by the Township of Red Rock to conduct the bi-annual structural inspection of four bridges and one culvert located in Red Rock.

The purpose of this exercise was to assess the physical and functional characteristics of the various bridge elements, and to provide recommendations for remedial repair, where required, at each of the five structures.

Bi-annual inspections are required to be done by municipal bridge owners in accordance with the Public Transportation and Highway Improvement Act (Ontario Regulation 104/97).

The five structures considered in this exercise are as follows:

- 1. Red Rock Bridge No. 1 Highway No. 628 over Trout Creek
- 2. Red Rock Bridge No. 2 Red Rock Road No. 1 over Trout Creek
- 3. Red Rock Bridge No. 3 Buchanan Road over Trout Creek
- 4. Red Rock Bridge No. 4 Red Rock Road No. 4 over Trout Creek
- 5. Red Rock Bridge No. 5 Red Rock Road No. 5 over Trout Creek

On May 24, 2023 Michael Edmonds, P.Eng., and Mathew Currie, P.Eng., from JML Engineering completed a site inspection of the existing structures. The inspection was performed and the data was recorded as per the requirements of the Ministry of Transportation's 'Ontario Structural Inspection Manual' (OSIM). The physical and functional condition of all bridge elements were assessed and recorded. Photographs were taken of all significant findings.

This report is divided into five sections; one for each structure. A brief description of each structure is provided. The significant findings observed during the field investigation are identified. Recommendations for remedial repairs are made, complete with estimated

construction costs. The Bridge Condition Index is also identified. OSIM data sheets and photographs complete the balance of each bridge report.

At Red Rock Bridge No. 1, Bent #12 has rotated toward the watercourse, resulting in a significant lean at the columns and piles. Bent #12 also contains numerous very severely rotten and split piles, and the pile cap does not bear adequately upon the piles. Elsewhere, severely rotten pile caps and piles were observed. These deficiencies are detrimental to the load carrying capacity of the structure, and require rehabilitation to be completed in the next 3-4 months. The estimated construction cost for this work, including engineering and contingency, is approximately \$260,000.00 + HST.

Red Rock Bridge No. 1 continues to deteriorate over successive inspections. The movements at the bents, rotten load carrying elements, rotten deck, and continual maintenance costs at this structure indicate that it is reaching the end of its useful life. Replacement of the structure should be considered within the next 5-10 years.

At Red Rock Bridge No. 3, several cotter pins which prevent the truss panel connection pins from loosening and falling out are missing. One panel pin has shifted 75 mm. We recommend new cotter pins be provided and the shifted panel pin be driven back into position. This work is urgent and should be completed in the next 1-3 months.

Significant corrosion resulting in several holes and thinning of the steel was observed at the invert of the barrel at Red Rock Bridge No. 5. This deficiency affects the load carrying capacity of the culvert, and makes it more prone to washout and/or sudden collapse. Replacement of the culvert should be considered, with an approximate replacement construction cost of \$ 378,000.00 + HST, including engineering and contingency.

A summary of the estimated construction costs to implement all recommended remedial repairs for each structure is as follows:

Structure Name	Repair Timing	Estimated Remedial Repair Cost
Red Rock Bridge No. 1	3-4 Months	\$ 260,000.00
	1-2 Years	\$ 138,000.00
Red Rock Bridge No. 2	1-2 Years	\$ 76,600.00
Red Rock Bridge No. 3	1-2 Years	\$ 41,200.00
Red Rock Bridge No. 4	1-2 Years	\$ 32,700.00
	5 Years	\$ 90,000.00
Red Rock Bridge No. 5	5 Years	\$ 378,000.00
Total Construction Cost Estim	nate	\$ 1,016,500.00 + HST

The estimated remaining service lives of Red Rock Bridge No. 2, No. 3, and No. 4 are 20 years, 10 years, and 25+ years, respectively.

Closing

We recommend that the next inspection of all five structures be done in 2025.

Even though the structural inspection was carefully done, we do not claim that the observations made represent all of the faults or imperfections which may exist.

We trust this report is satisfactory. Please contact the undersigned if you require any additional information or clarification.

Best regards,

JML Engineering Ltd.



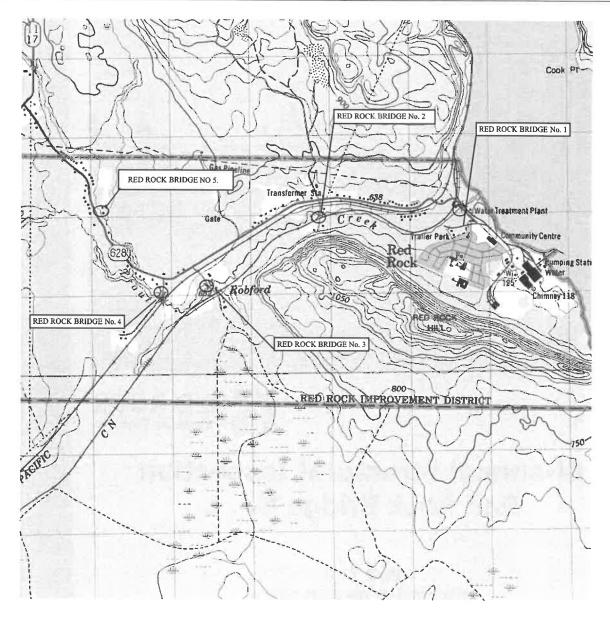
Michael Edmonds, P.Eng. Project Engineer



John M. Lorenowich, P. Eng. President

:me Encl.

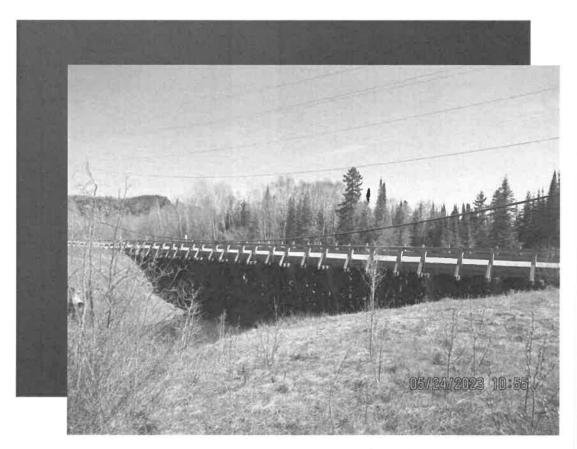
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Location Map: Red Rock Bridges

Red Rock Bridge No. 1, Red Rock Bridge No. 2, Red Rock Bridge No. 3, Red Rock Bridge No. 4, and Red Rock Bridge No. 5

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Bi-annual Structural Inspection Red Rock Bridge No. 1

FOR THE TOWNSHIP OF RED ROCK



BRIDGE NO. 1 - HIGHWAY NO. 628 OVER TROUT CREEK

1.0 Description

Red Rock Bridge No. 1 is located on Highway No. 628 over Trout Creek at the entrance into the town of Red Rock. The structure is currently load posted at 25/40/55 tonnes.

The structure is a two lane, multi-span bridge with an overall length of approximately 59 meters. There are 14 spans which range between 2.43 and 5.25 metres. The overall width of the structure is approximately 12.65 metres. The deck consists of longitudinal nail laminated treated timbers which have been transversely post-tensioned by steel bars (installed in 1986). The wear surface consists of hot mix asphalt. The asphalt wear surface is approximately 200 mm – 225 mm thick. The deck is supported by timber pile and lagging abutments and 13 intermediate timber bents numbered from the south end to the north end. A timber pedestrian walkway is located along the west side of the structure. See attached existing bridge drawing for reference.

Substantial reconstruction of this bridge was performed in 1986 with several remedial repairs performed in 1992, 2002, 2009, 2011, 2016 and 2020.

2.0 Significant Findings

Fill loss was observed at the west side behind the south abutment wall.

Separation of timber lagging with loss of fill was observed at the south abutment.

U-shaped CSP culverts that were installed to reduce erosion at the embankments have severely corroded. Severe erosion was observed at the south embankment beneath the bridge and at the northwest embankment.

Debris has accumulated in the stream at the upstream side of the bridge.

Approximately 25 linear meters of severe longitudinal and transverse cracks were observed at the asphalt approaches. Moderate erosion was observed at the northwest corner. Gravel has accumulated throughout the approaches.

Alligator cracking was observed at the asphalt walkway approach at the south end. Impact damage was observed at the north end.

One offset timber at the west side of the bridge guiderail has severe rot. Six offset timbers at the guiderail are loose/rotated.

Seven loose guide rail splice bolts and one missing bolt was observed.

One broken clamp was observed at the guide rail outrigger at Bent #2.

Three sidewalk planks at the south end are loose or missing. Four planks are deteriorated at the

north end. Medium splits were observed throughout most planks. Medium to severe rot was observed at a few planks.

Impact damage was observed at a section of curb near the north end. Medium abrasion was observed throughout the curb.

Approximately 280 linear meters of severe longitudinal and transverse cracks were observed at the asphalt wearing surface. Several potholes were also observed.

Severe rot and failed laminations was observed at the deck soffit between Bent 4 and Bent 6.

Broken timber braces were observed at Bent #5 and severe rot was observed at a brace at Bent #4

The piles along the north embankment, specifically Bents #10 thru #13 appear to be slowly sliding in a southerly direction towards the stream. Bent #4 and Bent #5 appear to be slowly sliding in a northerly direction towards the stream.

The columns and piles at Bent #12 are significantly out of plumb. All of the tops of the piles are severely rotten and very severely split. The bearing timber does not bear adequately upon the piles.

The second pile from the east end of Bent # 11 is out of plumb.

Very severe rot was observed at the top of one pile at both Bent #11 and Bent #13.

Very severe rot was observed at the east end of the pile caps at Bent #5 and Bent #6.

The top of piles and pile caps at Bents #4, #5, and #13 have been buried for over a decade and have not been inspected.

The structure is currently load posted at 25/40/55 tonnes. The load posting sign recommended in the JML Engineering 2009 structural evaluation was 23/40/56. However, we feel the current posting is adequate and can remain.

3.0 Monitoring

A monitoring system was established at Bent #12 in 2021. The readings taken to date are summarized on the attached sketch. The results of the monitoring are inconclusive if rotation is progressing.

4.0 Conclusions and Recommendations

The significant deficiencies observed at Bent #12, the severely rotten sections of the pile caps at Bent #5 and Bent #6, and the severely rotten tops of timber piles affect the load carrying capacity of the structure. A reduced load posting at this crossing will likely be required, based upon these

deficiencies. If rehabilitation does not proceed in the near term, a structural evaluation should be done to determine the required, reduced load posting.

The ongoing movements at the bents at the north and south embankments is likely due to subsurface slippage of the embankments.

We recommend the following remedial repairs be done within the next 3-4 months:

- Excavate the north and south embankments to remove excess soil. Reshape the embankments to flatten the slopes. This should reduce subsurface slippage at the embankments, and reduce movements at the bents. The U-shaped culverts will be removed and replaced in kind or with asphalt swales to facilitate this work.
- While excavating at the embankments, expose the pile caps and top of piles at Bents #4, #5, and #13 for inspection by an Engineer.
- Rehabilitate Bent #12 by cutting and splicing all piles below grade and resetting the bent plumb. Temporary closure and temporary shoring of the bridge will be required to perform this work.
- Reset the column at Bent #11 plumb.
- Replace the two rotten sections of pile caps at Bent #5 and Bent #6. This will also require temporary closure and temporary shoring of the bridge.
- Cut and splice the top of the rotten piles at Bents #11 and #13.
- Replace broken timber braces at Bent #5.

We recommend the remaining remedial repairs be done in 1-2 years:

- Provide fill behind the west side of the south abutment wall.
- Install timber lagging where lagging has separated at the south abutment.
- Remove debris upstream of bridge.
- Repair and rout and seal cracks at asphalt approaches. Remove gravel.
- Repair asphalt at walkway approach.
- Replace rotten offset timber and shim/plumb offset timbers at guide rail.
- Tighten guide rail bolts at seven locations and install one bolt.

- Replace guide rail outrigger clamp at Bent #2.
- Replace deteriorated sidewalk planks at sidewalk.
- Replace one section of curb at the north end.
- The excessive thickness of asphalt on the deck contributes significant dead load to the structure. The asphalt should be milled and repaved, maintaining 80-150 mm overall thickness. The cracks and potholes in the asphalt should be sealed.

We recommend the following additional studies be done in the next 1-2 years:

- An Enhanced OSIM inspection or Detailed Timber Investigation should be done due to the deteriorated deck laminations observed at the soffit. The entire soffit of the deck should be inspected within arm's reach based upon the observed deficiencies.
- Continue to monitor the rotation at Bent #12 monthly as per the table established within this report until the short-term repairs are done.
- Monitor the rotation of Bent #4 and Bent #5.
- Resurrect the soil monitoring system that was last done by JML Engineering in November 2009 to identify sub-surface soil movements at the two embankments.
- An underwater investigation should be done to assess the condition of the piles below the waterline.

5.0 Estimated Construction Costs

The estimated construction costs for the remedial repairs recommended within the next 3-4 months are as follows:

Excavate and reshape embankments, drainage improvements	\$ 40,000.00
Reconstruct Bent #12	\$ 90,000.00
Replace rotten section of pile caps at Bent #5 and Bent #6	\$ 40,000.00
Replumb column at Bent #11, replace broken/rotten bracing	\$ 10,000.00
Subtotal	\$ 180,000.00
Mob/Demob (15%)	\$ 20,000.00
Engineering/Contingency (35%)	\$ 60,000.00
Total Estimated Construction Cost	\$260,000.00 + HST

The following are the estimated construction costs for the remaining recommended remedial repairs to be done in 1-2 years:

Provide fill behind the north abutment wall	\$ 2,000.00
Install timber lagging at the south abutment	\$ 2,000.00
Remove debris from stream	\$ 1,000.00
Remove gravel from deck	\$ 1,000.00
Rout and seal asphalt cracks, fill potholes	\$ 30,000.00
Repair asphalt at walkway approaches	\$ 2,000.00
Guide rail repairs and maintenance	\$ 2,500.00
Replace deteriorated sidewalk planks	\$ 1,000.00
Replace one section of curb	\$ 500.00
Mill and repave asphalt	\$ 50,000.00
Subtotal	\$ 92,000.00
Mob/Demob (15%)	\$ 13,800.00
Engineering and Contingency (35%)	\$ 32,200.00
Total Construction Cost Estimate	\$ 138,000.00 + HST

The BCI is the ratio of the value of each bridge element in its current state to the total replacement value of the bridge. The overall Bridge Condition Index (BCI) of Red Rock Bridge No. 1 is 70. The BCI value of the bridge indicates the bridge is in fair condition. However, the BCI does not take into account the rotation of Bent #12, nor the reduced contact area at the top the piles throughout.

Red Rock Bridge No. 1

Inventory Data:		
Structure Name	Red Rock Bridge No. 1	
Main Hwy/Road #	Hwy 628 On ⊠ Under □	Crossing ☐ Navig. Water ☑ Non-Navig. Water Type: ☐ Rail ☐ Road ☐ Ped. ☐ Other
Hwy/Road Name	HWY 628	
Structure Location	2 km E along Hwy 628 from	intersection with Red Rock Road No. 1
Latitude	48° 56' 46" N	Longitude 88° 15' 40" W
Owner(s)	Township of Red Rock	Heritage ☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. Designation: ☐ Desig./not List ☐ Desig. & List
MTO Region	Northwestern	Road Class: Freeway Arterial Collector Local
MTO District	Thunder Bay	Posted Speed 50 km/hr No. of Lanes Two
Old County	Thunder Bay	AADT % Trucks
Geographic Twp.		Inspection Route Sequence
Structure Type	Longitudinal Post- Tensioned Timber Deck with Timber Substructure	Interchange Number
Total Deck Length	59.03 (m)	Interchange Structure Number
Overall Str. Width	12.65 (m)	Min. Vertical Clearance (m)
Total Deck Area	501.75 (sq.m)	Special Routes: ☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.50 (m)	Detour Length Around Bridge 5 (km)
Skew Angle	0 (Degrees)	Direction of Structure North/South
No. of Spans	14	Fill on Structure - (m)
Span Lengths	3.50, 2.43, 2.53, 4.50, 4.30, 4 0.85	(m)
Historical Data:		
Year Built		Year of Last Major Rehab. 2020
Last OSIM Inspection	2021	Last Evaluation 2009
Last Enhanced OSIM I	nspection	Current Load Limit 25/40/55 (tonnes)
Enhanced Access Equ (ladder, boat, lift, etc.)		Load Limit By-Law #
Last Underwater Inspe	ection	By-Law Expiry Date
Last Condition Survey		
removed from behind 2003 – New timber ha 2008 – Various timber 2011 – Various remed 2016 – Various remed evaluation. 25/40/55 l	Bent #11 to relieve earth pressundrails, new pile splices/clamp r pile repairs. ial repairs to correct deficiencies	s/shims, new timber bracing, new timber guiderail posts. es outlined in 2011 report. es outlined in 2015 report. Load posted at 23/40/56 based upon 2009

Field Inspection Inform	nation:						
Date of Inspection:	May 2	4, 2023	Type of Inspe	ection:	Ø OS	SIM 🗆 Enha	nced OSIM
Inspector:	Micha	el Edmond	s, P.Eng., JML Engine	ering			
Others in Party:	Mathe	w Currie, P	Eng., JML Engineeri	ng			
Access Equipment Used:							
Weather:	Clear						
Temperature:	2° Cel	sius					
Additional Investigatio	ns Requ	uired:		31		Priority	
				1	None	Normal	Urgent
Material Condition Survey							
Detailed Deck Condit			1 1 1 0 10 1		√		
Non-destructive Delar			Asphalt-Covered Deck	:	1		
Concrete Substructure Detailed Coating Con-				-	√		
Detailed Timber Inves		ivey.		_		/	
Post-Tensioned Strang		ation		_	√		
Underwater Investigation:	1117 0011	544011				✓	
Fatigue Investigation:					1		
Seismic Investigation:					1		
Structure Evaluation:					√		
Monitoring							
Monitoring of Deform	nations, S	ettlements	and Movements:			/	
Monitoring Crack Wie					✓		
nvestigation Notes: Enha	nced OS	IM and Det	ailed Timber Investig	ation. A	An unde	rwater investig	ation should
be done to assess the condi	ition of t	ne piles bel	ow the waterline. Mo	nitor ro	tation a	Bent #12.	
Overall Structure Note	s:	11 - 2011					
Recommended Work on Structure:		□ None	☐ Minor Rehab.	⊠ M	ajor Re	hab. 🗆 Rej	place
Timing of Recommended	Work:	⊠1 to 5 ye	ears	rs			
Overall Comments:			Il from embankments, nis year. Replacement				lace rotten
Date of Next Inspection:		2025					
spected Performance Deficiencies							
Load carrying capacity Excessive deformations (deflect Continuing settlement Continuing movements Seized bearings		06 07 tions) 08 09 10	Bearing not uniformly loads Jammed expansion joint Pedestrian/vehicular hazard Rough riding surface Surface ponding Deck drainage	ed/unstable	12 13 14 15 16	Slippery surfaces Flooding/channel bl Undermining of fou Unstable embankme Other	ndation
aintenance Needs							
Lift and Swing Bridge Maintena: Bridge Cleaning Bridge Handrail Maintenance Painting Steel Bridge Structures Bridge Deck Joint Repair Bridge Bearing Maintenance	nce	07 08 09 10 11	Repair to Structural Steel Repair of Bridge Concrete Repair of Bridge Timber Bailey Bridges - Maintenand Animal/Pest Control Bridge Surface Repair	e	14 15 16 17	Erosion Control at E Concrete Sealing Rout and Seal Bridge Deck Draina Scaling (Loose Cond Other	ge

Red Rock Bridge No. 1

Element Data

Element Group:	Abutment		Length:				
Element Name:	Abutment Wall		Width:		9.30	m	
Location:	North/South		Height:		1.0 r	n	
Material:	Timber		Count:		2		
Element Type:			Total Qua	ntity:	19 sc	ı. m.	
Environment: (Benign) Moderate	/ Severe	Limited Ir				
Protection System:	Creosote			•			Performance
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
	m / each / % / all		19		_	1001	16
Comments: Some		orner Geotes		north ab	utme	nt wall Sou	
between lagging, be	tween 6 th and 8 th pil	e.	mo ripped di	norm ac	, aunio	ii waii. Boa	ui — Space
Recommended Wo	rk: Rehab	☐ Replac	е	Main	tenan	ce Needs:	13
	□ 1-5 □	years 🗆 6-10	years	☐ Urge	ent	□ 1 year	☑ 2 year
Install timber planks	***************************************		***************************************	Monito			
		9_9					
Element Group:	Abutments		Length:		0.30	5 m	
Element Name:	Pile Caps		Width:		9.3 n	n	
Location:	North/South		Height:		0.30	5 m	
Material:	Timber		Count:				
Element Type:			Total Qua	ntity:	23 sc	լ. m.	
Environment:	Benign / Moderate	/ Severe	Limited In	spection	ı 🗆		
Protection System:	Creosote						Performance
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data: (m ²)m	/ each / % / all		23				
Comments:					,		
Recommended Wo	rk:	ab 🗆 Repl	ace	Maint	tenan	ce Needs:	
Recommended Wo	rk:			Maint			☐ 2 year
Recommended Wo							□ 2 year
	□ 1-5 y		years		ent	□ 1 year [□ 2 year
Element Group:	☐ 1-5 y		years Length:		0.3 n	□ 1 year □	□ 2 year
Element Group: Element Name:	Abutments Piles		Length: Width:		0.3 n 0.300	□ 1 year □ 1 0 m	☐ 2 year
Element Group: Element Name: Location:	Abutments Piles North/South		Length: Width: Height:		0.3 n 0.300 0.6 n	□ 1 year □ 1 0 m	□ 2 year
Element Group: Element Name: Location: Material:	Abutments Piles North/South Timber		Length: Width: Height: Count:	Urg	0.3 n 0.300 0.6 n 23	1 year [] 1 m	⊒2 year
Element Group: Element Name: Location: Material: Element Type:	Abutments Piles North/South Timber Penta	rears □ 6-10	Length: Width: Height: Count: Total Qua	□ Urg	0.3 n 0.300 0.6 n 23	1 year [] 1 m	☐ 2 year
Element Group: Element Name: Location: Material: Element Type: Environment:	Abutments Piles North/South Timber	rears □ 6-10	Length: Width: Height: Count:	□ Urg	0.3 n 0.300 0.6 n 23	1 year [] 1 m	
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Element Group: Element Name: Location: Material: Element Type: Environment:	Abutments Piles North/South Timber Penta	rears □ 6-10	Length: Width: Height: Count: Total Qua	□ Urg	0.3 n 0.300 0.6 n 23 13 sq	1 year [] 1 m	
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Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² m Comments: North- South - 4th from east	Abutments Piles North/South Timber Penta Benign) Moderate Units / each / % / all - 7th from east: 70%: 80% contact	/ Severe	Length: Width: Height: Count: Total Qua: Limited In	ntity: spection	0.3 n 0.300 0.6 n 23 13 sq	1 year [] n 0 m n	Performance
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: Comments: North- South - 4th from east - 9th from east	Abutments Piles North/South Timber Penta Benign Moderate Units / each / % / all - 7th from east: 70%: 80% contact	/ Severe	Length: Width: Height: Count: Total Qua: Limited In	ntity: spection	0.3 n 0.300 0.6 n 23 13 sq	1 year [] n 0 m n	Performance
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: Comments: North- South - 4 th from east - 9 th from east - 10 th form eas	Abutments Piles North/South Timber Penta Benign / Moderate Units // each / % / all - 7th from east: 70% : 80% contact :: 60% contact st: 50% contact	/ Severe	Length: Width: Height: Count: Total Qua: Limited In	ntity: spection	0.3 n 0.300 0.6 n 23 13 sq	1 year [] n 0 m n	Performance
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² m² Comments: North- South - 4 th from east - 9 th from east - 10 th form east - 11 th form east	Abutments Piles North/South Timber Penta Benign Moderate Units // each / % / all - 7th from east: 70%: 80% contact st: 50% contact st: 50% contact st: 70% contact	/ Severe	Length: Width: Height: Count: Total Qua: Limited In	ntity: spection	0.3 n 0.300 0.6 n 23 13 sq	1 year [] n 0 m n	Performance
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² m² Comments: North- South - 4 th from east - 9 th from east - 10 th form east - 11 th form east	Abutments Piles North/South Timber Penta Benign) Moderate Units // each / % / all - 7 th from east: 70% : 80% contact :: 60% contact st: 70% contact st: 70% contact st: 60% contact	/ Severe	Length: Width: Height: Count: Total Qua: Limited In	ntity: spection	0.3 n 0.300 0.6 n 23 13 sq	1 year [] n 0 m n	Performance
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² m² Comments: North- South - 4th from east - 9th from east - 10th form ea - 12th from east 10th pile from east ha	Abutments Piles North/South Timber Penta Benign) Moderate Units // each / % / all - 7th from east: 70% : 80% contact :: 60% contact st: 70% contact st: 70% contact st: 60% contact st: 60% contact st: 60% contact	/ Severe Exc. 6 contact. 2,3	Length: Width: Height: Count: Total Quar Limited In Good 13 ,7,8,9,10,11 s	ntity: espection Fai	0.3 n 0.300 0.6 n 23 13 sq	□ 1 year [n n n n n n n Poor	Performance
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: Comments: North- South - 4 th from east - 9 th from east - 10 th form ea - 11 th form ea - 12 th from east	Abutments Piles North/South Timber Penta Benign Moderate Units / each / % / all - 7th from east: 70%: 80% contact st: 60% contact st: 50% contact st: 70% contact st: 60% contact st: 60% contact st: 60% contact st: 60% contact	/ Severe Exc. 6 contact. 2,3	Length: Width: Height: Count: Total Qua: Limited In Good 13 ,7,8,9,10,11 s	ntity: spection Fai	0.3 n 0.300 0.6 n 23 13 sq	1 year [n n n n n n n Poor	Performance Deficiencies
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² m² Comments: North- South - 4th from east - 9th from east - 10th form ea - 12th from east 10th pile from east ha	Abutments Piles North/South Timber Penta Benign Moderate Units / each / % / all - 7th from east: 70%: 80% contact st: 60% contact st: 50% contact st: 70% contact st: 60% contact st: 60% contact st: 60% contact st: 60% contact	/ Severe Exc. 6 contact. 2,3	Length: Width: Height: Count: Total Qua: Limited In Good 13 ,7,8,9,10,11 s	ntity: espection Fai	0.3 n 0.300 0.6 n 23 13 sq	□ 1 year [n n n n n n n Poor	Performance

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Red Rock Bridge No. 1

Element Data

Element Gro	_	Bracing		Length:		Vari	es	
Element Nam	ie:	Cross Bracing	ie di	Width:		0.04	5 m	
Location:		Longitudinal and T	ransverse	Height:		0.15	0 m	
Material:		Timber		Count:		44 tr	ansverse and	l 24 longitudinal
Element Type				Total Qua	ntity:	68		
Environment	:	Benign / Moderate	/ Severe	Limited In	nspection			
Protection Sy	stem:	Creosote						Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m^2/m	(each) % / all		68				01
		th bolts severely co	rroded.	-				
Recommend	led Wor		. 1	ace	Main	tenan	ce Needs:	09
		□ 1-5	years 🛭 6-10	years	☐ Urge	ent [☐ 1 year	☐ 2 year
Element Grou		Bracing		Length:		Vari	es	
Element Nam	e:	Horizontal		Width:		0.04	5 m	
Location:		Longitudinal and Ti	ransverse	Height:		0.20	3 m	
Material:		Timber		Count:		22 tr	ansverse and	l 4 longitudinal
Element Type				Total Qua		30		
Environment		Benign Moderate	/ Severe	Limited Ir	rspection			
Protection Sy	stem:	Penta						Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m ² /m	(each) % / all		27			3	
severely rotte	n brace							Bent #5. One
Recommend	ea wor						ce Needs:	
3 1 1 1		***************************************	rears	ears	☐ Urge	ent	□ 1 year	☐ 2 year
Replace brok	en and i	rotten bracing.						
Element Grou	ıp:	Accessories		Length:				
Element Nam	e:	Signs		Width:				
Location:		Corners of Structure	е	Height:				
Material:		Steel		Count:				
Element Type				Total Qua		6		
Environment:		Benign / Moderate		Limited In	spection			
Protection Sy	stem:	Galvanized/Painted						Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m^2/m	(each) % / all		6				
Comments:	Four H	azard Marker signs	, two load post	ing signs.				
Recommend	ed Wor	k: Reha	b Replace	9	Maint	tenan	ce Needs:	
		□ 1-5 y	ears 🗆 6-10 ye		☐ Urge	ent	☐ 1 year	☐ 2 year

Red Rock Bridge No. 1

Element Data

Element Grou	ıp:	Embankments and	Streams	Length:				
Element Nam	e:	Embankments		Width:				
Location:		North/South		Height:				
Material:		Silty clay with gras	s/shrubs	Count:		6		
Element Type	2:			Total Qua	ntity:	6		
Environment:	:	Benign / Moderate	/ Severe	Limited I				
Protection Sy	stem:				•			Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m ² / m	/(each)/ % / all		3	3	_	1001	
		ed culvert sections	ware installed	_	_	scion	of ambanka	nanta Thar harra
very severe c	orrosio	n. Severe erosion a	were mistancu it couth ambon	kment henen	th bridge	SIOII (bt orogion u	inclus. They have
		ere erosion at north			ui oriuge	. Ligi	iii erosion u	inder bridge at
north end. Ve	ery seve	ere erosion at north	west embankin	ient.				
Recommend	ed Wo	rk: 🛛 Reha	ib 🗆 Repla	ce	Main	tenan	ce Needs:	
		☑ 1-5	years		☐ Urge	ent	☐ 1 year	☐ 2 year
Provide slope	protec	tion. Replace culve	ert sections.				pe stability.	~~~~~~~~~~ ~
Element Grou		Embankments and		Length:				
Element Nam	e:	Streams and Watery	ways	Width:				
Location:				Height:				
Material:				Count:				
Element Type				Total Qua		All		
Environment:		Benign Moderate	/ Severe	Limited Ir	spection			
Protection Sys	stem:							Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Condition Data:	m^2/m	Units / each / % / (all)	Exc.	Good X	Fai	r	Poor	
Data:		/each/%/all		X	Fai	r	Poor	Deficiencies 13
Data:				X	Fai	r	Poor	
Data:		/each/%/all		X	Fai	r	Poor	
Data: Comments:	Multip	/ each / % / (all) le logs and debris a	t upstream sid	X e.				13
Data:	Multip	/ each / % / all le logs and debris a	t upstream side	X e.	Maint	tenan	ce Needs:	13
Data: Comments:	Multip	/ each / % / (all) le logs and debris a	t upstream side	X e.	Main t	t enan ent	ce Needs: ☑ 1 year	13
Data: Comments:	Multip	/ each / % / all le logs and debris a	t upstream side	X e.	Maint	t enan ent	ce Needs: ☑ 1 year	13
Data: Comments: Recommend	Multip	/ each / % / all le logs and debris a rk:	t upstream side	e. ace years	Main t	tenan ent /e log	ce Needs: ☑ 1 year s.	13
Data: Comments: Recommend	Multip	/ each / % / all le logs and debris a rk:	t upstream side	e. ace years Length:	Main t	tenan ent ve log	ce Needs: ☑ 1 year s.	13
Data: Comments: Recommend Element Grou	Multip	/ each / % / all le logs and debris a rk:	t upstream side	X e. Acce years Length: Width:	Main t	tenan ent /e log	ce Needs: ☑ 1 year s.	13
Data: Comments: Recommend Element Grout Element Name Location:	Multip	/ each / % / all le logs and debris a rk:	t upstream side	X e. Acce years Length: Width: Height:	Main t	tenan ent ve log 6.0 n 8.4 n	ce Needs: ☑ 1 year s.	13
Data: Comments: Recommend Element Grout Element Name Location: Material:	Multip	/ each / % / all le logs and debris a rk:	t upstream side	X e. Length: Width: Height: Count:	Main t □ Urge Remov	tenan ent ve log 6.0 n 8.4 n	ce Needs: 1 year s.	13
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type	Multip	/ each / % / all le logs and debris a rk:	t upstream side	X e. Length: Width: Height: Count: Total Qua	Maint ☐ Urge Remov	6.0 m 8.4 m 2	ce Needs: ☑ 1 year s.	13
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type Environment:	Multip	/ each / % / all le logs and debris a rk:	t upstream side	X e. Length: Width: Height: Count:	Maint ☐ Urge Remov	6.0 m 8.4 m 2	ce Needs: 1 year s.	13
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type Environment: Protection Sys	Multip	/ each / % / all le logs and debris a rk: Reha 1-5 y Approaches Wear Surface North/South Asphalt Benign / Moderate	t upstream side	X e. Length: Width: Height: Count: Total Qua	Maint ☐ Urge Remov	tenan ent /e log 6.0 n 8.4 n	ce Needs: 1 year s. n	13 18 □ 2 year Performance
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition	ed Wor	/ each / % / all le logs and debris a rk:	t upstream side	X e. Length: Width: Height: Count: Total Qua Limited In	Maint □ Urge Remov ntity: spection	tenan ent /e log 6.0 n 8.4 n	ce Needs: 1 year s. n sq. m.	18 2 year Performance Deficiencies
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type Environment: Protection Syst Condition Data:	ed Wor	/ each / % / all le logs and debris a rk: □ Reha □ 1-5 y Approaches Wear Surface North/South Asphalt Benign / Moderate Units / each / % / all	t upstream side	Length: Width: Height: Count: Total Qua Limited In	Maint Urge Remov	6.0 m 8.4 m	ce Needs: 1 year s. n n Poor 8	18
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	ed Worder: up: e: m²)m Approx	/ each / % / all le logs and debris a rk:	t upstream side b Replacears 6-10 Severe Exc.	Length: Width: Height: Count: Total Qua Limited In	Maint Urge Remov	6.0 m 8.4 m	ce Needs: 1 year s. n n Poor 8	18
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data: Comments: accumulation	ed Worder ip: e: Approx. Mode	/ each / % / all le logs and debris a rk: □ Reha □ 1-5 y Approaches Wear Surface North/South Asphalt Benign / Moderate Units / each / % / all cimately 25 linear materate erosion at north	t upstream side b Replacears 6-10 Severe Exc. neters of sever hwest corner.	Length: Width: Height: Count: Total Qua Limited In	Maint Urge Remov	tenan ent ve log 6.0 m 8.4 m 2 101 s	ce Needs: 1 year s. Poor 8 se cracks.	18
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	ed Worder ip: e: Approx. Mode	/ each / % / all le logs and debris a rk: □ Reha □ 1-5 y Approaches Wear Surface North/South Asphalt Benign / Moderate Units / each / % / all cimately 25 linear materate erosion at nortick: □ Reha	t upstream side b	Length: Width: Height: Count: Total Qua Limited In Good 91 e longitudina	Maint Urge Remove ntity: spection Fai 2 l and tra Maint	tenan ent ve log 6.0 m 8.4 m 2 101 s	ce Needs: 1 year s. Poor 8 se cracks. ce Needs:	18 □ 2 year Performance Deficiencies 09 Gravel 02
Data: Comments: Recommend Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data: Comments: accumulation	ed Wor	/ each / % / all le logs and debris a rk: □ Reha □ 1-5 y Approaches Wear Surface North/South Asphalt Benign / Moderate Units / each / % / all timately 25 linear norte rate erosion at norte k: □ Reha □ 1-5 y	t upstream side b	Length: Width: Height: Count: Total Qua Limited In Good 91 e longitudina	Maint Urge Remov	tenan ent ve log 6.0 m 8.4 m 2 101 s	ce Needs: 1 year s. Poor 8 se cracks.	18

Ontario Structure Inspection Manual – Inspection Form MTO Site Number: Red Rock Bridge No. 1

Element Data

Element Gro	un.	Approaches		Lamatha		F		
Element Nan		Sidewalk		Length: Width:		5 m		
Location:	10.	North/South		Height:		1.21	11	
Material:		Asphalt		Count:		2		
Element Type	•	Aspilait		Total Qua	_4:4	12 sq. m.		
Environment		Benign / Moderate	(Severe)	Limited In			վ. m.	
Protection Sy		Denight / Moderate	Severe	Limiteu II	ispection			D6
Condition	Stem.	Units	Exc.	Good	177 - 2		D	Performance Deficiencies
Data:	2		Exc.		Fai	r	Poor	
		/ each / % / all		7	2		3	16
		damage at northwe	est corner. Me	dium longitu	dinal cra	ick at	south end. L1	ght alligator
cracks at sou								
Recommend	led Wo	rk: \square Reha	b 🗖 Replac	e			ce Needs:	18
		□ 1-5 y	vears 🔲 6-10	ears/	☐ Urge	ent	□ 1 year □	2 year
					Repair	asph	alt at ramp.	
El	10.50	1		T				
Element Gro		Approaches		Length:		53 m	east side, 38 m	west side
Element Nam	ie:	Railing System		Width:				
Location:		North Approach		Height:				
Material:		Timber/Steel		Count:		0.1		
Element Type Environment		Davies / 64. davie	Severe	Total Qua		91 m	1	
Protection Sy		Benign / Moderate	Severe	Limited In	ispection			Th. 0
	stem:	Galvanizing	77	~ .	-		_	Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:		each / % / all		78			13	
Weathering a	one se	verely rotten offset w corroded fastener	rs. Loose splic	e bolts at we	st side.	t side,	one offset rot	ated east side.
Recommend	led Wor	k: 🛛 Reha	b Replac	ce	Maint	tenan	ce Needs:	
		⊠1-5 y	ears 🗆 6-10 y	ears	☐ Urge	ent	⊠ 1 year □	2 year
Replace one	rotten o	ffset – west side. F	Replumb rotate	d offsets.	Tighten	loose	bolts.	
Element Grou	ıp:	Approaches	THE SHE	Length:		56 m	east side, 35 m	west side
Element Nam	_	Railing System		Width:		2011.	cust side, 33 ii	West side
Location:		South Approach		Height:				
Material:		Timber/Steel		Count:				
Element Type	e:			Total Qua	ntity:	91 m		
Environment		Benign Moderate	/ Severe	Limited In				
Protection Sy	stem:	Penta/Galvanized						Performance
Condition	-	Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m²(m)	each / % / all		87	4	_	1 001	
		urface corrosion wa	as observed. T			act ci	de One offset	rotated west
		at most posts. Two						
southeast cor		at most posts. Two	roose spiree t	ions at cast a	nu west	siucs.	One boit mis	sing at
Recommend		k: 🛛 Reh	ab 🗆 Repla	100	Mains	anar	ce Needs:	
Kecommend	eu wor	K: ⊠ Kena ⊠1-5 y			wraini	enan	ce iveeas:	
Replumb rota	ited offs		она 🗀 0-10 у	cais	Urge	ent	⊠ 1 year □	2 year
replanto lote	0113	vis.						
					FIOVIG	c boit	at post. Tight	en loose bolts.

Red Rock Bridge No. 1

Element Data

Element Group:	Sidewalks/Curbs		Length:		59.5	m	
Element Name:	Sidewalks		Width:		1.22	5 m	
Location:	West side of structu	ire	Height:				
Material:	Timber		Count:		1		,i
Element Type:			Total Qua	ntity:	73 se	q. m	
Environment:	Benign / Moderate	Severe	Limited Ir	spection		-	
Protection System:	CCA						Performance
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data: m ² m	/each/%/all		67	3		3	08
Comments: Mediu	m splits throughout	most planks. 1	Medium abra	sion thr	ougho	out. Impact d	lamage north end.
Three planks missin	g at south end, med	ium to severe r	ot at a few p	lanks.			
Recommended Wo	rk: Reha	ab 🗆 Repla	ce	Main	tenan	ce Needs:	12
	□ 1-5 y	ears	ears	☐ Urge	ent	☑ 1 year	2 year
***************************************			***************************************	Replac	e 12 i	olanks.	
	-			1			
Element Group:	Sidewalks/Curbs		Length:		59.0	3 m	
Element Name:	Curb		Width:		0.34		
Location:	East Side of Structu	ıre	Height:		0.34		
Material:	Timber		Count:		80 sc	ą. m.	
Element Type:			Total Qua		2		
Environment:	Benign / Moderate	(Severe)	Limited In	spection			
Protection System:	CCA						Performance
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
	/each/%/all		72			8	08
Comments: Mediu		d throughout. l		ge at no	rthwe		08
	m abrasion observed		mpact dama			st corner.	08
Comments: Mediu	m abrasion observed	b Replac	mpact dama	Maint	tenan	st corner.	12
Comments: Mediu	m abrasion observe rk: ⊠ Reha ⊠ 1-5 y	b □ Replac	mpact dama		tenan	st corner.	
Recommended Wo	rk: ⊠ Reha ⊠ 1-5 y ection of curb.	b □ Replac	mpact dama e ears	Maint	e nan ent	st corner. ce Needs: □ 1 year [12
Recommended Wo Replace northwest s Element Group:	rk:	b □ Replac	mpact dama e ears Length:	Maint	ent 59.0	st corner. ce Needs: 1 year 3 m	12
Recommended Wo Replace northwest s Element Group: Element Name:	rk: ⊠ Reha ⊠ 1-5 y ection of curb.	b □ Replac	mpact dama e e ears Length: Width:	Maint	59.00 8.50	st corner. ce Needs: l year m	12
Recommended Wo Replace northwest s Element Group: Element Name: Location:	rk: Reha 1-5 y ection of curb. Decks Wearing Surface	b □ Replac	mpact dama e ears Length: Width: Height:	Maint	ent 59.0	st corner. ce Needs: l year m	12
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material:	rk:	b □ Replac	mpact dama e ears Length: Width: Height: Count:	Maint □ Urge	59.03 8.50 0.10	st corner. ce Needs: 1 year m m	12
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material: Element Type:	rk: Reha 1-5 y ection of curb. Decks Wearing Surface Asphalt	ab □ Replac years □ 6-10 y	mpact dama e e ears Length: Width: Height: Count: Total Qua	Maint □ Urge	59.00 8.50 0.10	st corner. ce Needs: l year m	12
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material: Element Type: Environment:	rk: Reha 1-5 y ection of curb. Decks Wearing Surface	ab □ Replac years □ 6-10 y	mpact dama e ears Length: Width: Height: Count:	Maint □ Urge	59.00 8.50 0.10	st corner. ce Needs: 1 year m m	12 □ 2 year
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material: Element Type: Environment: Protection System:	rk:	b Replace Gears 6-10 y	mpact dama e e ears Length: Width: Height: Count: Total Qua Limited In	Maint □ Urge ntity:	59.00 8.50 0.10	st corner. ce Needs: l year m m sq. m	12 2 year Performance
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition	rk: Reha 1-5 y ection of curb. Decks Wearing Surface Asphalt Benign / Moderate Units	ab □ Replac years □ 6-10 y	e ears Length: Width: Height: Count: Total Qual	Maint □ Urge	59.00 8.50 0.10	st corner. ce Needs: 1 year m m sq. m	12 2 year Performance Deficiencies
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² m	rk: Reha 1-5 y ection of curb. Decks Wearing Surface Asphalt Benign / Moderate Units each / % / all	severe Exc.	mpact dama e ears Length: Width: Height: Count: Total Qual Limited In	Maint □ Urge ntity: spection	59.00 8.50 0.10	st corner. ce Needs: 1 year m m sq. m Poor 90	Performance Deficiencies 09
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition	rk: Reha 1-5 y ection of curb. Decks Wearing Surface Asphalt Benign / Moderate Units each / % / all imately 280 linear references	Severe Exc.	Length: Width: Height: Count: Total Qua Limited In	Maint Urge ntity: spection Fair	59.00 8.50 0.10	st corner. ce Needs: 1 year m m Poor 90 nal cracks.	Performance Deficiencies 09 Two potholes.
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: Comments: Approx Poorly patched pother	rk: Reha 1-5 y ection of curb. Decks Wearing Surface Asphalt Benign / Moderate Units each / % / all imately 280 linear roles at west side. G	Severe Exc. meters of severe ravel accumula	Length: Width: Height: Count: Total Qua Limited In Good 412 etransverse attion along contents	Maint Urge ntity: spection Fair and long urbs. Ap	59.00 8.50 0.10 502 s	st corner. ce Needs: 1 year m m Poor 90 nal cracks. 7 imately 200	Performance Deficiencies 09 Two potholes. mm – 225 mm
Recommended Wo Replace northwest s Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: Comments: Approx Poorly patched poth thick asphalt.	rk: Reha 1-5 y ection of curb. Decks Wearing Surface Asphalt Benign / Moderate Units each / % / all imately 280 linear roles at west side. G	Severe Exc. meters of severe ravel accumula	Length: Width: Height: Count: Total Qual Limited In Good 412 etransverse attion along cone	Maint Urge ntity: spection Fair and long urbs. Ap	59.00 8.50 0.10 502 s	st corner. ce Needs: 1 year m m Poor 90 nal cracks.	Performance Deficiencies 09 Two potholes.

Red Rock Bridge No. 1

Element Data

Element Group:	Deck		Length:		59.0 m	1	
Element Name:	Deck Top		Width:		9.3 m		
Location:			Height:		0.250	m	
Material:	Timber		Count:				
Element Type:			Total Qua	ntity:	546 sq	. m	
Environment:	Benign / Moderate	/ Severe	Limited In	spection			
Protection System:			···				Performance
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data: m ² m	/ each / % / all		369	90		90	
Comments: Unable	to inspect majority	of deck top du	e to wearing	surface	•		
Recommended Wo	rk: Reh	ab 🗆 Replac	e	Maint	tenance	e Needs:	
***************************************	□ 1-5 y	***************************************	***************************************	☐ Urge	ent 🗀	l year	2 year
Element Group:	Deck		Length:		59.03	m	
Element Name:	Soffit		Width:		9.3 m		
Location:	DOTAL STATE		Height:		0.250		
Material:	Timber		Count:		0.230	111	
Element Type:			Total Qua	ntity:	549 sq	m.	
Environment:	Benign / Moderate	/ Severe	Limited In				
Protection System:							Performance
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
	/ each / % / all	ZAC.			-		01
			A47	26		76	
		side. Post-tensi	497 oned rods ar	26 e lightly	corrod	26 led. Seve	
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out.	ppears wet at each at the second at the seco	delamination (1	oned rods ar noisture) ber	e lightly tween B	ent #5-	led. Seve #6. Delar	re rot and failed ninations between
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-	ppears wet at each at the second and the second and the second and the second are	delamination (1 n from east. Po	oned rods ar moisture) be st tensioning	e lightly tween Be g channe Maint	ent #5-all and pa	led. Seve #6. Delar lates medi	re rot and failed ninations between
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out.	ppears wet at each at the second at the seco	delamination (1 n from east. Po	oned rods ar moisture) be st tensioning	e lightly tween Be g channe	ent #5-all and pa	led. Seve #6. Delar lates medi	re rot and failed ninations between
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out.	ppears wet at each at the second and the second and the second and the second are	delamination (1 n from east. Po	oned rods ar moisture) be st tensioning	e lightly tween Be g channe Maint	ent #5-all and pa	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended World	ppears wet at each at the second and the second and the second and the second are	delamination (1 n from east. Po	oned rods ar moisture) be st tensioning	e lightly tween Be g channe Maint	ent #5-all and pa	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended World Element Group:	ppears wet at each at 4. Medium rot and #9 above 6th column rk: Reha 1-5 y	delamination (1 n from east. Po	oned rods ar moisture) be st tensioning	e lightly tween Be g channe Maint	ent #5-all and pa	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended World Element Group: Element Name:	ppears wet at each at 4. Medium rot and #9 above 6th column rk: Reha 1-5 y Decks Drainage System	delamination (1 n from east. Po	oned rods armoisture) beto st tensioning ce ears Length: Width:	e lightly tween Be g channe Maint	ent #5-all and pa	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended World Element Group: Element Name: Location:	ppears wet at each at 4. Medium rot and #9 above 6th column rk: Rehating 1-5 y Decks Drainage System West side	delamination (1 n from east. Po	oned rods ar moisture) bet st tensioning ce ears Length: Width: Height:	e lightly tween Be g channe Maint	ent #5-i	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material:	ppears wet at each at 4. Medium rot and #9 above 6th column rk: Reha 1-5 y Decks Drainage System	delamination (1 n from east. Po	oned rods ar moisture) bet st tensioning ce ears Length: Width: Height: Count:	e lightly tween Bog channe Maint	ent #5-il and p.	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material: Element Type:	ppears wet at each at 4. Medium rot and and above 6th columns rk: Rehation Rehation 1-5 years	delamination (n from east. Po	ce ears Length: Width: Height: Count: Total Qua	me lightly tween Bog channed Maint	ent #5-il and p. tenance ent □ 25 25	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material: Element Type: Environment:	ppears wet at each at 4. Medium rot and #9 above 6th column rk: Rehating 1-5 y Decks Drainage System West side	delamination (n from east. Po	oned rods ar moisture) bet st tensioning ce ears Length: Width: Height: Count:	me lightly tween Bog channed Maint	ent #5-il and p. tenance ent □ 25 25	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion 2 year
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material: Element Type: Environment: Protection System:	ppears wet at each at 4. Medium rot and and and above 6th columns. rk: Reha 1-5 y Decks Drainage System West side Steel Benign / Moderate	delamination (1 n from east. Po	ce ears Length: Width: Height: Count: Total Qua	me lightly tween Boy g channe Maint Urge	ent #5-al and proceed tenance ent	led. Seve #6. Delar lates med: e Needs: 1 year	re rot and failed minations between ium corrosion 2 year Performance
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition	ppears wet at each at 4. Medium rot and	delamination (n from east. Po	ce ears Length: Width: Height: Count: Total Qua Limited In	me lightly tween Bog channed Maint	ent #5-al and proceed tenance ent	led. Seve #6. Delar lates medi	re rot and failed minations between ium corrosion
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² (ea	ppears wet at each at 4. Medium rot and 4. Medium rot and 49 above 6th column rk: Reha 1-5 y Decks Drainage System West side Steel Benign / Moderate Units ch) % / all	delamination (1 n from east. Post Ab Replace Replace 6-10 y	ce ears Length: Width: Height: Count: Total Qua Limited In	Maint Maint Urge	ent #5-al and proceed tenance ent	led. Seve #6. Delar lates med: e Needs: 1 year	re rot and failed minations between ium corrosion 2 year Performance
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition	ppears wet at each at 4. Medium rot and 4. Medium rot and 49 above 6th column rk: Reha 1-5 y Decks Drainage System West side Steel Benign / Moderate Units ch) % / all	delamination (1 n from east. Post Ab Replace Replace 6-10 y	ce ears Length: Width: Height: Count: Total Qua Limited In	Maint Maint Urge	ent #5-al and proceed tenance ent	led. Seve #6. Delar lates med: e Needs: 1 year	re rot and failed minations between ium corrosion 2 year Performance
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² (ea	ppears wet at each at 4. Medium rot and and and above 6th columns. rk: Reha 1-5 y Decks Drainage System West side Steel Benign / Moderate Units ch) % / all ge tubes below side	delamination (in from east. Posts Replace Replace G-10 y	ce ears Length: Width: Height: Count: Total Qua Limited In Good 25 ccumulation	me lightly tween Boy channed Maint Urge	ent #5-il and p. tenance ent □ 25 25 □	led. Seve #6. Delar lates med: e Needs: 1 year	re rot and failed minations between ium corrosion 2 year Performance
Comments: Soffit a laminations at Bent 4 Bents #7-#8 and #8-through out. Recommended Work Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: m² (ea	ppears wet at each at 4. Medium rot and and and above 6th columns. rk: Reha 1-5 y Decks Drainage System West side Steel Benign / Moderate Units ch) % / all ge tubes below side	delamination (1 n from east. Post	ce ears Length: Width: Height: Count: Total Qua Limited In	me lightly tween Boy channed Maint Urge	tenance tenance tenance tenance tenance tenance tenance tenance	led. Sever #6. Delar lates medi e Needs: 1 year	re rot and failed minations between ium corrosion 2 year Performance

Ontario Structure Inspection Manual – Inspection Form MTO Site Number: Red Rock Bridge No. 1

Element Data

Element Group:	ement Group: Piers			Length:		12.6 m			
Element Name: Caps		3		Width:	Width:		0.305 m		
Location:				Height:		0.305 m			
Material:	Timber			Count:		14			
Element Type:				Total Quantity:		218 sq. m.			
Environment:	Benign /	Moderate /	Moderate / Severe Limited			nspection			
Protection System	n:							Performance	
Condition	Units		Exc.	Good	Fair		Poor	Deficiencies	
Data: m	/ all		218						
Comments: Light checking throughout.									
Recommended Work:		☐ Rehab ☐ Replace		ce	Mainten		e Needs:		
		☐ 1-5 years ☐ 6-10 ye		years	☐ Urge	ent	☐ 1 year	☐ 2 year	

Ontario Structure Inspection Manual - Inspection Form MTO Site Number: Red Rock Bridge No. 1

Element Data

Element Gro	up:	Piers	Length:		0.310			
Element Nam	ne: Piles		Width:	Width:		0.300 m		
Location:						1.2 m		
Material:	Timber			Count:		110		
Element Type:			Total Qua	Total Quantity: 129 s		29 sq. m.		
Environment: Benign Moderate / Severe			Limited Inspection					
Protection System: Creosote							Performance	
Condition		Units Exc.		Good	Fai	r	Poor	Deficiencies
Data: (m ²) m	/ each / % / all		89	20		20	01

Comments: *Note: Bents are numbered from south to north. Piles are numbered from east to west.

Bent #1

- 1st pile from east side, approx. 80% contact.
- 2nd pile from east side, severe crack completely through pile, approx. 60% contact. Pile is banded.
- 3rd pile from east side, medium split, approx. 70% contact. Pile is banded.
- 4th pile from east side, severe crack completely through pile, approx. 90% contact. Pile is banded. Bands are loose.
- 5th pile from east side, approx. 80% contact, pile is banded.

Bent #2

- 2nd pile from east side, approx. 90% contact.
- 3rd pile from east side, approx, 80% contact.
- 4th pile from east side, approx. 80% contact.
- 5th pile from east side, approx. 50% contact. Pile is shimmed.

Bent #4 – Very severe splits 2nd pile from east. Piles are buried and not accessible.

Bent #5 – Piles are buried, not accessible.

Bent #6

- 1st and 2nd pile from east side, severe splits.
- 3rd pile from east side, severe split in line with bolt at strap.
- 4th pile from east side 60% contact, shimmed.
- 6th pile from east side medium rot.
- 7th pile from east side 70% contact.
- 8th pile from east side 80% contact.
- 10th pile from east side, medium split along south side.

Bent #7

- 1st pile from east side, approx. 80% contact.
- 2nd, 3rd, 4th and 11th pile from east side, severe split in line with bolt at strap.
- 4th pile from east side 80% contact.
- 5th pile from east side very severe split.
- 11th pile from east side, severe splitting and checking along north side, strapping has buckled.

Bent #8

- 1st pile from east side, severe split.
- 2nd pile from east side, approx. 60% contact, severe split.
- 3rd pile from east side 70% contact.
- 6th pile from east side, severe split at vertical strap.
- 7th pile from east side, severe split on west side.

Ontario Structure Inspection Manual - Inspection Form MTO Site Number: Red Rock Bridge No. 1

Comments: *Note: Bents are numbered from south to north. Piles are numbered from east to west. Bent #9

- 1st pile from east side, severe split, broken strapping.
- 2nd and 6th pile from east side, medium splitting throughout.
- 3rd pile from east side 60% contact, medium splits.
- 4th pile from east side 80% contact.
- 7th pile from east side, medium split along north side.
- 11th pile from east side, medium split.
- 12th pile from east side very severe split and severe rot.

Bent #10

- 1st pile from east side, approx. 5% contact (redundant, 2nd pile close by).
- 2nd pile from east side, severe split.
- 4th pile from east side, severe split, loose strapping.
- 5th pile from east side, severe split.
- 7th pile from east side, 80% contact.
- 8th pile from east side, severe split.
- 9th pile from east side, medium split along north side.

Bent #11

- 1st, 2nd, 3rd, 5th, 7th spliced.
- 4th pile from east side, shimmed, severe split.
- 6th pile from east side, medium split, approx. 70% contact.
- 8th pile from east side, severe split and light to medium rot, approx. 50% contact. Pile is shimmed.
- 9th pile from east side, very severe split and crushing, very severe rot.

Bent #12

- Bent #12 is leaning significantly to the south, see attached monitoring sketch.
- 1st pile cut off but not replaced.
- 2nd pile, top has been spliced and replaced, 10% contact with pile cap due to rotation. Pile splice has shifted off pile.
- 3rd and 4th piles from east side, very severe vertical splits, 3rd 70% contact, 4th 30% contact however due to rotation drift pin is splitting top of pile.
- 5th pile from east side, severe split, 30% contact due to rotation. Has been shimmed with plastic plates.
- 6th pile from east side, very severe split and approx. 80 mm of decay on exposed face of pile, 20% contact. Significantly out of plumb. Plastic shim is loose.
- 7th pile, top has been spliced and replaced. Pile splice leaning opposite to other piles, implying splice connection has failed below grade.
- 8th pile has been shimmed with plastic plates. Very severely rotten.
- 9th pile very severe deterioration, but redundant. Spike has severe corrosion.

Bent #13

- 1st, 2nd and 7th piles from east side are buried.
- 6th pile from east side has very severe rot and splits.

Bent #14

- 1st pile from east side, removed but not replaced.
- 7th pile from east, replaced with 250x250 member and steel jacket.

It was observed that the piles along the north embankment, specifically Bents #10 thru #13 are slowly sliding in a southerly direction. The piles at Bent #12 are all severely out of plumb.

Recommended Work:		☐ Replace	Maintena	ance Needs:	09	
	☐ 1-5 years	☐ 6-10 years	☐ Urgent	☐ 1 year		
Shims to be installed to re-esta	ablish full bear	Monitor progression of splits. Monitor				
Provide splice at missing/brok	en piles. Prov	rotation of Bent #12.				
pile at Bent #11. Splice one p	ile at Bent #11					
Rehabilitate Bent #12.						

Red Rock Bridge No. 1

Element Data

		1								
Element Gro		Piers		Length:			9.00m			
Element Nam			Width:		0.305m					
Location:		m		Height:		0.305m				
Material:	Timber			Count:			r bent			
				Total Quantity: 156 sq. m.						
				Limited In	ıspection					
	Protection System: Performance									
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies		
Data:		/ each / % / all		134	11 11					
Comments: A severe split exists at the east end of the pile cap at Bent #11. Very severe full thickness split, very severe rot and crushing at east end, 4.6 m long at Bent #6. Severe rot at east 4.6 m at Bent #5.										
Recommend	lod Wo									
Recommend	ieu wo		ab ⊠ Repla years □ 6-10 y					09		
D -1		****	years 🗀 0-10 y	ears			☐ 1 year	☑ 2 year		
Replace rotte	n pile c	aps.			Monito	or pro	gression of	split.		
Element Gro	up:	Piers		Length:		0.30	5 m			
Element Nam	_	Columns		Width:		0.30				
Location:		0014111115		Height:		5.30				
Material:		Timber		Count:			r bent			
Element Type	e:			Total Qua	ntity:		sq. m.			
Environment		Benign / Moderate	/ Severe	Limited In			5q. III.			
Protection Sy			7 501010	Zimiteta II	spection	<u> </u>		Performance		
Condition		Units	Exc.	Good	Fair		Poor	Deficiencies		
Data:	m ²) m		EAC.			_	1 001			
574 00 UI										
Comments: Many columns are out of plumb with the most significant variances at Bents #11 through #13. Medium to severe checks and splits.										
		nns leaning signific	antly aguth							
		3 from east, strapp		1						
		shifted north approx			1 4/6	:1				
Bent #A Al	i posis s	ns shifted except #2	and #6 similar	i except #2 a	na #0, p	ne ca	p and plies r	noving north.		
Bent #10 6	h noat fr	om east overhanging	z and #0 smma	r to bent #3.						
Bent #10 - 0	post II	om cast overnangn	ng pine cap, no	strapping at t	oase.		_4 4			
Recommend		nn severe split at to						er.		
Recommend	ieu woi					ce Needs:				
	***************************************	⊠1-5 y	ears				☐ 2 year			
					Underwater inspection to confirm					
_					conditi	on of	piles.			
Element Grou	ıp:	Barriers		Length:		59.0	m			
Element Nam		Railing System		Width:		27.0				
Location:		East and West sides		Height:						
Material:		Steel and timber		Count:						
					Total Quantity: 118 m					
					Limited Inspection					
Protection System: Galvanized/CCA Performance										
Condition		Units	Exc.	Good	Fair	r	Poor	Deficiencies		
Data:	m ² (m	Deach / % / all		118						
			e splice holts a		hree loos	e at e	act cide O	ne broken alamn		
Comments: Light checking. Two loose splice bolts at west side, three loose at east side. One broken clamp at guide rail outrigger at Bent #2.										
Recommend	ed Wor	·k: □ Reha	b 🗆 Replac	ce	Maintenance Needs: 18					
	\square 1-5 years \square 6-10 ye				Urge			□ 2 year		
				Tighten loose bolts.						
					1 ignien ioose polis.					

Ontario Structure Inspection Manual – Inspection Form MTO Site Number: Red Rock Bridge No. 1

Element Data

Element Group: Barriers		Barriers	Length:			59.0 m			
Element Name: Handrail		Handrail	drail		Width:		0.24 m		
Location: West Side		West Side of Struct	Side of Structure		Height:		0.19 m		
Material:	Material: Timber		iber		Count:				
Element Type	e:		Tota		uantity: 59 m		1		
Environment	:	Benign / Moderate	Moderate / Severe Limited Inspe			pection 🗆			
Protection Sy	stem:			0/-				Performance	
Condition	Units		Exc.	Good	Fair		Poor	Deficiencies	
Data:	m ² (m	each / % / all		59					
Comments:									
Recommend	ace	Main	tenan	ce Needs:					
<u> </u>	****	□ 1-5 y	rears	years	☐ Urge	ent	☐ 1 year	☐ 2 year	



Photo 1: North approach.



Photo 2: South approach.



Photo 3: Upstream view.



Photo 4: Downstream view.



Photo 5: Upstream elevation.



Photo 6: Downstream elevation.



Photo 7: Northeast embankment.



Photo 8: Southeast embankment.



Photo 9: Northwest embankment.



Photo 10: Southwest embankment.



Photo 11: Deck cross section.



Photo 12: North abutment.



Photo 13: South abutment.



Photo 14: Deck underside (typ.).



Photo 15: Impact damage at asphalt at north walkway approach.



Photo 16: Severe transverse crack at asphalt wear surface (typ.).



Photo 17: Medium longitudinal crack at south approach.



Photo 18: Medium cracking at pedestrian walkway.

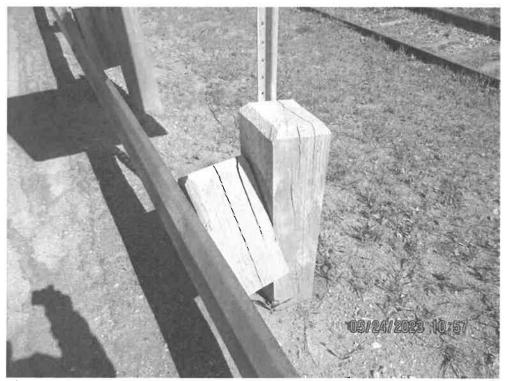


Photo 19: Rotated loose offset timber at guide rail post (typ.).

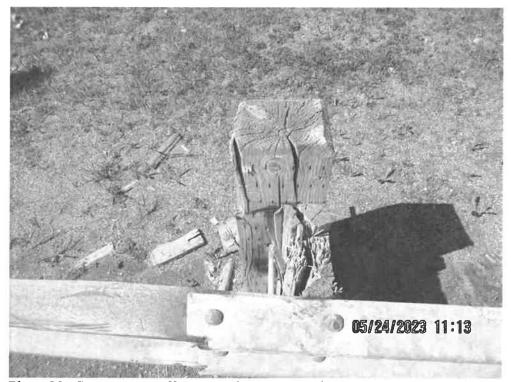


Photo 20: Severe rot at offset at northeast approach.



Photo 21: Missing bolt at guide rail to post connection.



Photo 22: Three missing deck timbers at walkway.



Photo 23: Impact damage at curb at north end.



Photo 24: Severe longitudinal crack full length of deck at southbound lane.



Photo 25: Severe transverse cracks full width of deck.



Photo 26: First pile from east removed at Bent #14.



Photo 27: Very severe rot at 8th pile from east at Bent #12.



Photo 28: Approximately 50% contact at two piles at the south abutment (9th and 10th pile from east).

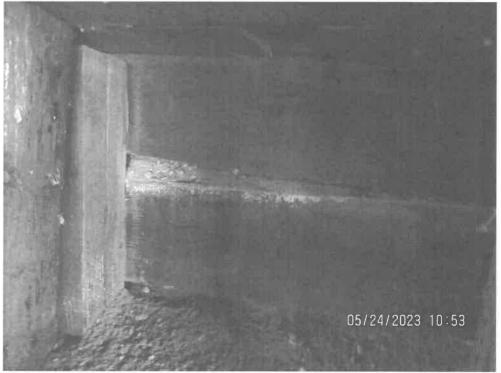


Photo 29: Separation of timber lagging at south abutment.

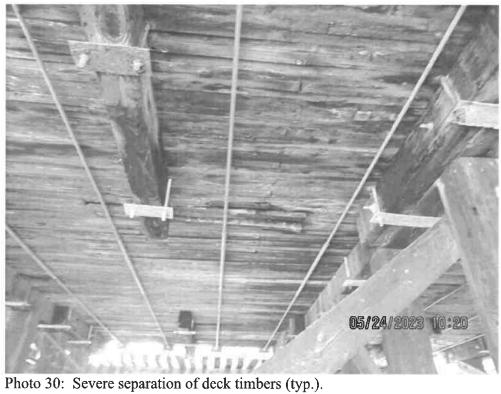




Photo 31: Erosion at southwest embankment.



Photo 32: Severe corrosion at drainage culvert at southwest corner.



Photo 33: Severe erosion at south embankment.



Photo 34: Severe erosion at north embankment.



Photo 35: Load posting sign (typ.).

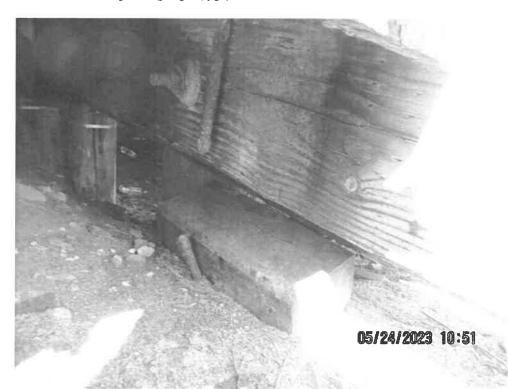


Photo 36: Broken thru-bolt at clamp at Bent #2.



Photo 37: Strapping buckled at pile (typ.).



Photo 38: Pile not in full contact with pile cap (typ.).



Photo 39: Rotation of piles and pile cap at Bent #12.



Photo 40: Severe rot and pile not in contact at Bent #12.



Photo 43: Cracks in soil between Bent #12 and #13.



Photo 44: Brocken timber brace (typ.).

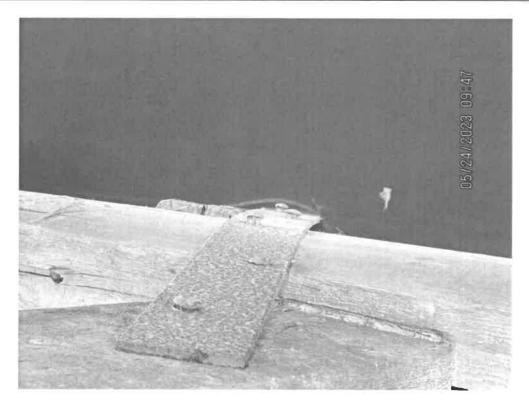
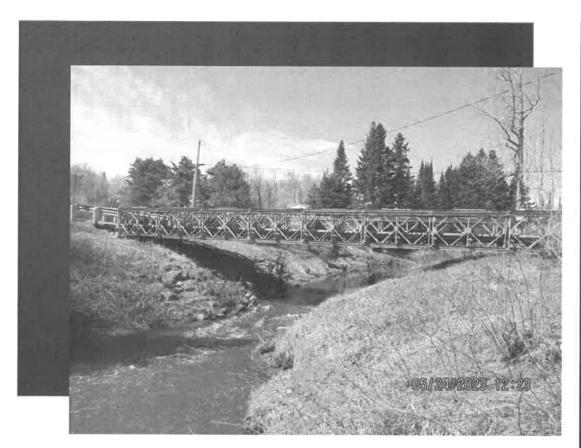


Photo 45: Very severe rot at pile cap.



Photo 46: Typical translation of piles and bents.





Bi-annual Structural Inspection Red Rock Bridge No. 2

FOR THE TOWNSHIP OF RED ROCK



RED ROCK BRIDGE NO. 2 – RED ROCK ROAD NO. 1 OVER TROUT CREEK

1.0 Description

Red Rock Bridge No. 2 is located on Red Rock Road No. 1 over Trout Creek approximately 0.2 kilometres west of Highway No. 628. The structure is currently load posted at 25/40/55 Tonnes.

The structure is a single lane, single span Double-Single Reinforced Bailey Bridge with a timber deck and a timber wear surface constructed in a herringbone pattern. The deck is supported by steel stringers on steel transom beams. The ends of the transoms sit upon "double-single reinforced" pre-engineered steel trusses which bear upon steel base plates over timber levelling pads. The bridge span is 24.384 metres. The deck width between curbs is 3.35 metres.

2.0 Significant Findings

Most wearing surface planks are loose and deflect under wheel loads.

Five rotten wearing surface planks were observed.

One bolt is missing at the east curb. All bolts are loose at both curbs.

The curbs do not extend the full length of the bridge.

One panel pin is backed out at the east side of the bridge. Five cotter pins are missing. One bracing bolt is loose.

Three loose sway braces were observed.

Gravel has accumulated on the bearing timbers. There are two large wood blocks beneath the transom beam at the north bearing timber.

The Narrow Structure sign at the south approach is missing.

A Hazard Marker sign at south side is leaning.

The steel flex beam guide rail at the approaches is mounted too high. Only half of guide rail splice bolts are installed. The guide rail connection to the bridge is improper and does not extend across the bridge.

Three offset timbers have rotated at the south approach. One loose bolt and impact damage was observed at the northeast guiderail.

Erosion was observed at the southwest and north embankments.

3.0 Conclusions and Recommendations

We recommend the following remedial repairs be done within the next 1-2 years:

- Secure loose wearing surface planks.
- Replace five wearing surface planks.
- Tighten loose bolts and provide one bolt at curb.
- Extend and provide new curb at the corners of the bridge.
- Re-install one panel pin, provide five cotter pins, and tighten one loose bracing bolt.
- Tighten three braces.
- Remove gravel and wood blocks at bearing timbers.
- Provide a Narrow Structure sign at the south approach.
- Plumb Hazard Marker sign.
- Replace steel beam guide rail at approaches, and extend guide rail across the bridge at the correct height.
- Shim three offset timbers at the south approach guide rail, and tighten one loose bolt.
- Replace one section of guiderail at the northeast corner of the site.
- Provide rock protection c/w geotextile at eroded areas.

4.0 Estimated Construction Costs

The following are the estimated construction costs for the recommended remedial repairs:

Replace five wearing surface planks Tighten loose bolts and provide one bolt at curb Tighten three braces Provide curb at corners of bridge Reinstall one panel pin, provide cotter pins, tighten bracing bolt Remove gravel and wood blocks from bearing timbers Provide Narrow Structure sign at south approach, plumb Hazard Marker sign Replace guide rail at approaches. Extend guide rail across bridge Shim offset timbers and tighten one loose bolt. Replace one section of guide rail Replace one section of guide rail Replace one section of guide rail Mob/Demob (15%) Signologo	Secure wearing surface planks	\$ 500.00
Tighten three braces Provide curb at corners of bridge Reinstall one panel pin, provide cotter pins, tighten bracing bolt Remove gravel and wood blocks from bearing timbers Provide Narrow Structure sign at south approach, plumb Hazard Marker sign Replace guide rail at approaches. Extend guide rail across bridge Shim offset timbers and tighten one loose bolt. Replace one section of guide rail Provide Rock protection c/w geotextile Subtotal Mob/Demob (15%) Engineering and Contingency (35%) \$ 1,000.00 \$ 1,000.00 \$ 1,000.00 \$ 51,000.00 \$ 7,600.00 \$ 18,000.00	Replace five wearing surface planks	\$ 500.00
Provide curb at corners of bridge Reinstall one panel pin, provide cotter pins, tighten bracing bolt Source Remove gravel and wood blocks from bearing timbers Provide Narrow Structure sign at south approach, plumb Hazard Marker sign Replace guide rail at approaches. Subtotal Subtotal Subtotal Provide Reinstall one panel pin, provide cotter pins, tighten bracing bolt Source Subtotal	Tighten loose bolts and provide one bolt at curb	\$ 500.00
Reinstall one panel pin, provide cotter pins, tighten bracing bolt Remove gravel and wood blocks from bearing timbers Provide Narrow Structure sign at south approach, plumb Hazard Marker sign Replace guide rail at approaches. Structure sign at south approach, plumb Hazard Marker sign Replace guide rail at approaches. Structure sign at south approach, plumb Hazard Marker sign Structure sign at south approach, plumb Hazard Marker sign Structure sign at south approach, plumb Hazard Marker sign Structure sign at south approach, plumb Hazard Marker sign Structure sign at 1,000.00 Structure sign at south approach, plumb Hazard Marker sign Structure sign at 1,000.00 Structure sign at south approach, plumb Hazard Marker sign Structure sign at 1,000.00 Structure sign at south approach, plumb Hazard Marker sign Structure sign at 1,000.00 Structure sign at south approach, plumb Hazard Marker sign Structure sign at south approach sign at 1,000.00 Structure sign at south approach, plumb Hazard Marker sign Structure sign at south approach sign at 1,000.00 Structure sign at south approach, plumb Hazard Marker sign Structure sign at south approach sign at 1,000.00 Structure sign at south approach, plumb Hazard Marker sign Structure sign at 1,000.00 Structure sign at south approach, plumb Hazard Marker sign Structure sign at south approach, plumb Hazard Marker sign Structure sign at south approach sign at south approac	Tighten three braces	\$ 1,000.00
Remove gravel and wood blocks from bearing timbers Provide Narrow Structure sign at south approach, plumb Hazard Marker sign Replace guide rail at approaches. Extend guide rail across bridge Shim offset timbers and tighten one loose bolt. Replace one section of guide rail Provide Rock protection c/w geotextile Subtotal Mob/Demob (15%) Engineering and Contingency (35%) \$ 1,000.00 \$ 1,000.00 \$ 51,000.00 \$ 7,600.00 \$ 18,000.00	Provide curb at corners of bridge	\$ 1,500.00
Provide Narrow Structure sign at south approach, plumb Hazard Marker sign Replace guide rail at approaches. Extend guide rail across bridge Shim offset timbers and tighten one loose bolt. Replace one section of guide rail Provide Rock protection c/w geotextile Subtotal Mob/Demob (15%) Engineering and Contingency (35%) \$ 1,000.00 \$ 12,000.00 \$ 16,000.00 \$ 15,000.00 \$ 51,000.00 \$ 7,600.00 \$ 18,000.00	Reinstall one panel pin, provide cotter pins, tighten bracing bolt	\$ 500.00
Replace guide rail at approaches. Extend guide rail across bridge Shim offset timbers and tighten one loose bolt. Replace one section of guide rail Provide Rock protection c/w geotextile Subtotal Mob/Demob (15%) Engineering and Contingency (35%) \$ 12,000.00 \$ 16,000.00 \$ 1,000.00 \$ 15,000.00 \$ 7,600.00 \$ 18,000.00	Remove gravel and wood blocks from bearing timbers	\$ 1,000.00
Extend guide rail across bridge \$ 16,000.00 Shim offset timbers and tighten one loose bolt. \$ 500.00 Replace one section of guide rail \$ 1,000.00 Provide Rock protection c/w geotextile \$ 15,000.00 Subtotal \$ 51,000.00 Mob/Demob (15%) \$ 7,600.00 Engineering and Contingency (35%) \$ 18,000.00	Provide Narrow Structure sign at south approach, plumb Hazard Marker sign	\$ 1,000.00
Shim offset timbers and tighten one loose bolt. Replace one section of guide rail Provide Rock protection c/w geotextile Subtotal Mob/Demob (15%) Engineering and Contingency (35%) \$ 500.00 \$ 1,000.00 \$ 51,000.00 \$ 7,600.00 \$ 18,000.00	Replace guide rail at approaches.	\$ 12,000.00
Replace one section of guide rail \$ 1,000.00 Provide Rock protection c/w geotextile \$ 15,000.00 Subtotal \$ 51,000.00 Mob/Demob (15%) \$ 7,600.00 Engineering and Contingency (35%) \$ 18,000.00	Extend guide rail across bridge	\$ 16,000.00
Provide Rock protection c/w geotextile \$ 15,000.00 Subtotal \$ 51,000.00 Mob/Demob (15%) \$ 7,600.00 Engineering and Contingency (35%) \$ 18,000.00	Shim offset timbers and tighten one loose bolt.	\$ 500.00
Subtotal \$ 51,000.00 Mob/Demob (15%) \$ 7,600.00 Engineering and Contingency (35%) \$ 18,000.00	Replace one section of guide rail	\$ 1,000.00
Mob/Demob (15%) \$ 7,600.00 Engineering and Contingency (35%) \$ 18,000.00	Provide Rock protection c/w geotextile	\$ 15,000.00
Engineering and Contingency (35%) \$ 18,000.00	Subtotal	\$ 51,000.00
	Mob/Demob (15%)	\$ 7,600.00
Total Construction Cost Estimate \$ 76,600.00 + HST	Engineering and Contingency (35%)	\$ 18,000.00
	Total Construction Cost Estimate	\$76,600.00 + HST

The existing load rating of 25/40/55 tonnes is based upon two transom beams per panel. To achieve unlimited load rating, two additional transom beams must be provided per panel (16 transom beams total). To install the transoms, the wear surface and deck will likely require replacement and the stringers should be removed. The estimated construction cost to provide new transom beams is an additional \$65,000.00 + HST.

The BCI is the ratio of the value of each bridge element in its current state to the total replacement value of the bridge. The overall Bridge Condition Index (BCI) of Red Rock Bridge No. 2 is 74. The BCI value of the bridge indicates the bridge is in fair condition.

Red Rock Bridge No. 2

Inventory Data:		
Structure Name	Red Rock Bridge No. 2	
Main Hwy/Road #	On ⊠ Under □	Crossing ☐ Navig. Water ☐ Non-Navig. Water Type: ☐ Rail ☐ Road ☐ Ped. ☐ Other
Hwy/Road Name	Red Rock Road No. 1	
Structure Location	0.2 km west of Hwy 628	
Latitude	48° 56' 43" N	Longitude 88°17′ 08" W
Owner(s)	Township of Red Rock	Heritage Designation □ Not Cons. □ Cons./not App. □ List/not Desig. □ Desig./not List □ Desig. & List
MTO Region	Northwestern	Road Class: Freeway ☐ Arterial ☐ Collector ☐ Local ☑
MTO District	Thunder Bay	Posted No. of Lanes 1
Old County	Thunder Bay	AADT % Trucks
Geographic Twp.		Inspection Route Sequence
Structure Type	Bailey – Double Single	Interchange Number
Total Deck Length	30.49 (m)	Interchange Structure Number
Overall Str. Width	5.49 (m)	Min. Vertical Clearance (m)
Total Deck Area	104.27 (sq.m)	Special Routes: ☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	3.42 (m)	Detour Length Around Bridge 5 (km)
Skew Angle	0 (Degrees)	Direction of Structure North to South
No. of Spans	One	Fill on Structure (m)
Span Lengths	24.4	(m)
Historical Data:		
		COLUMN TANKE THE PROPERTY OF T
Year Built		Year of Last Major Rehab. 2016
Last OSIM Inspection		Last Evaluation 2009
Last Enhanced OSIM I		Current Load Limit 25/40/55 (tonnes)
Enhanced Access Equ (ladder, boat, lift, etc.)		Load Limit By-Law #
Last Underwater Inspo	ection	By-Law Expiry Date
Last Condition Survey		
Rehab History: 2016 – Wear surface r transom beams per ba		ons provided. Load posted at 25/40/55 tonnes based upon two

Field Inspection Info	rmation							
Date of Inspection:	May	24, 2023	Type of Inspect	ion:	\boxtimes C	SIM	□ Enha	anced OSIM
Inspector:	Mich	ael Edmonds	s, P.Eng., JML Engineer	ing				
Others in Party:	Math	ew Currie, P	Eng., JML Engineering	<u> </u>				
Access Equipment Used	:							
Weather:	Sunn	у						
Temperature:	4° Ce	lsius						
Additional Investigat	ions Red	wired:				P	riority	
111 00019	ions iteq	luii cu.		N	lone		rmal	Urgent
Material Condition Surve	ev			-	·	110	111101	Orgoni
Detailed Deck Cond		/ev:			1			
			Asphalt-Covered Deck:		√			
Concrete Substructu					✓			
Detailed Coating Co					✓			
Detailed Timber Inv	estigation	l .			✓			
Post-Tensioned Stra	nd Invest	igation			1			
Underwater Investigation	n:				✓			
Fatigue Investigation:					✓			
Seismic Investigation:				✓				
Structure Evaluation:					✓			
Monitoring								
Monitoring of Defor	mations,	Settlements	and Movements:		✓			
Monitoring Crack W	/idths:				✓			
Investigation Notes:								
Overall Structure No	tes:	-						
Recommended Work on		□ None		ПΝ	laior F	Rehab.	R₁	eplace
Structure:								-P-444
Timing of Recommended	1 Work:	⊠1 to 5 ye	ars					
Overall Comments:		Miscellane	ous repairs and minor re	ehabil	itation	are req	uired.	
Date of Next Inspection:		2025						
spected Performance Deficienci	ies							
Load carrying capacity Excessive deformations (deflet Continuing settlement Continuing movements Seized bearings	ections & rota	06 07 ations) 08 09 10	Bearing not uniformly loaded/s Jammed expansion joint Pedestrian/vehicular hazard Rough riding surface Surface ponding Deck drainage	unstable	12 13 14 15 16	Flooding Undermi	surfaces y/channel blining of fou eembankmo	ndation
aintenance Needs			-					
Lift and Swing Bridge Mainte Bridge Cleaning Bridge Handrail Maintenance Painting Steel Bridge Structun Bridge Deck Joint Repair Bridge Bearing Maintenance		07 08 09 10 11	Repair to Structural Steel Repair of Bridge Concrete Repair of Bridge Timber Bailey Bridges - Maintenance Animal/Pest Control Bridge Surface Repair		13 14 15 16 17	Concrete Rout and Bridge D	Seal eck Draina	

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Red Rock Bridge No. 2

Element Data

Element Group:		Decks		Length:	Length:		24.390 m		
Element Name:		Wearing Surface		Width:		3.65	8 m		
Location:		-		Height:		0.04	5 m		
Material:		Wood		Count:					
Element Type:		Planks on herringbo	one pattern	Total Qua	ntity:	90 s	q. m		
Environment:		Benign / Moderate		Limited In			4. 111	_	
Protection System	n:								Performance
Condition		Units	Exc.	Good	Fai	r	Poor	-	Deficiencies
	2)/1	m / each / % / all	DAG	90	1 41		1 001	-	09
1/111	Comments: Wearing surface replaced in 2016. Most planks of						l loode Eis		
								ve i	otten planks.
Recommended	ecommended Work: 🛛 Rehab 🗖 Replac						ce Needs:		
		⊠ 1-5	years	years	☐ Urg	ent	☐ 1 year		2 year
Re-secure all loc	ose p	lanks.							
Element Group:		Decks		Length:		24.3	0		
Element Name:	-	Deck Top		Width:		3.65			
Location:		Deck Top		Height:		0.04		_	
Material:		Wood		Count:		0.04.	J III		
Element Type:		Wood Planks (timb	er checces)	Total Qua	ntitu	90 sc		_	
Environment:		Benign / Moderate		Limited Ir			4. III		
Protection System	n·	CCA Woderate	Severe	Limited II	ispection				Performance
Condition		Units	Exc.	Good	Fai	r	Poor	\dashv	Deficiencies
	1/m	/ each / % / all	EAC.		Fai	1	1001	-	Deficiencies
			1 1 1	90					
		to inspect top of de							
Recommended	Woı		1				ce Needs:		
***************************************		□ 1-5 y	years	ears	☐ Urge	ent	□ 1 year		2 year
Element Group:		Sidewalks/Curbs		Length:		24.3	m		
Element Name:		Curbs		Width:		0.152			
Location:		East and West sides		Height:		0.102			
Material:		Wood		Count:			bers per side	е	
Element Type:			700000	Total Qua	ntity:	12 sc			
Environment:		Benign / Moderate	(Severe)	Limited In					
Protection System	n:	CCA							Performance
Condition		Units	Exc.	Good	Fai	r	Poor		Deficiencies
Data: m)/m	/ each / % / all		9	3				08
Comments: Me	diur	n checks at a few till corners of approach			East bolt	s - 6 l	oose, 1 mis	sing	
Recommended '	Wor	k: 🗆 Reha	ab 🛚 Repla	ce	Maint	enan	ce Needs:		18
		⊠1-5 ye			Urge		☑ 1 year	_	☐ 2 year
Provide curb at 4	cor	ners of approaches.				*************			ride new bolt.

Red Rock Bridge No. 2

Element Data

Element Grou	up:	Beams/Main Longi	tudinal	Length:	Length: 3.048 m			
F1		Elements		****		0.01		
Element Nam	ie:	Stringers		Width:		0.04		
Location:		Deck		Height:		0.102		
Material:		Steel		Count:		8 spa		5 sets per span
Element Type		I-type complete wit						
Environment :		Benign / Moderate		Limited In	nspection			
Protection Sy	stem:	Hot dip galvanizing	Ş					Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m^2/m	(each) %/ all	120					
		corrosion throughou			·			
Recommend	led Wo						ce Needs:	
		□ 1-5	years \square 6-10	years	☐ Urge	ent	□ 1 year l	☐ 2 year
77								
Element Grou		Beams/Main Longi Elements	tudinal	Length:		5.490	0 m	
Element Nam	e:	Transom Beams		Width:		0.114	4 m	
Location:		Deck		Height:		0.254	4 m	
Material:		Steel		Count:		2 per	panel	
Element Type		I-type		Total Qua	ntity:	79 sq	. m.	
Environment:		Benign / Moderate	Severe	Limited Inspection				
Protection Sys	stem:	Hot dip galvanizing						Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
	7							
Data:	_ m²/)m	/ each / % / all		78	1			
Comments: per bay. Imp	Light cact dam	orrosion throughou nage at the end of or	ne transom.	rosion at one	e transon			2 transom beams
Comments:	Light cact dam	orrosion throughounge at the end of or	ne transom.	rrosion at one	e transon Maint	tenand	ce Needs:	
Comments: per bay. Imp	Light cact dam	orrosion throughou nage at the end of or	ne transom.	rrosion at one	e transon	tenand	ce Needs:	2 transom beams
Comments: per bay. Imp	Light cact dam	orrosion throughounge at the end of or	ne transom.	rrosion at one	e transon Maint	tenand	ce Needs:	
Comments: per bay. Imp	Light c act dam	orrosion throughou nage at the end of or rk:	ne transom.	ce years	e transon Maint	tenand	ce Needs: ☐ 1 year [
Comments: per bay. Imp	Light cact dam	orrosion throughou hage at the end of or rk:	ne transom. b □ Replace rears □ 6-10 y	ce vears	e transon Maint	t enan cent [ce Needs: 1 year [
Comments: per bay. Imp	Light cact dam	orrosion throughou hage at the end of or rk:	b Replace Greats 6-10 years	Length: Width:	e transon Maint	24.38 0.051	ce Needs: 1 year [34 m	
Comments: per bay. Imp Recommend Element Grout Element Name	Light cact dam	orrosion throughou hage at the end of or rk:	b Replace Greats 6-10 years	ce vears	e transon Maint	t enan cent [ce Needs: 1 year [34 m	
Comments: per bay. Imp Recommend Element Grout Element Name Location:	Light cact dam	orrosion throughout age at the end of or rk: Reha 1-5 y Trusses/Arches Top and Bottom Ch East and West sides	b Replace Greats 6-10 years	Length: Width:	Maint Urge	24.38 0.051 0.102	ce Needs: 1 year 34 m m 2 m	
Comments: per bay. Imp Recommend Element Grout Element Name Location: Material:	Light cact dam	orrosion throughout age at the end of or rk: Reha 1-5 y Trusses/Arches Top and Bottom Ch East and West sides Steel	b Replace Gears 6-10 y	Length: Width: Height: Count: Total Qua	Maint Urge	24.38 0.051 0.102 16	ce Needs: 1 year 34 m m 2 m	
Comments: per bay. Imp Recommend Element Grout Element Name Location: Material: Element Type Environment:	Light cact dam	orrosion throughout age at the end of or rk: Reha 1-5 y Trusses/Arches Top and Bottom Ch East and West sides Steel Benign / Moderate	b Replace rears 6-10 y	Length: Width: Height: Count:	Maint Urge	24.38 0.051 0.102 16	ce Needs: 1 year 34 m m 2 m	□ 2 year
Comments: per bay. Imp Recommend Element Grout Element Name Location: Material: Element Type	Light cact dam	orrosion throughout age at the end of or rk: Reha 1-5 y Trusses/Arches Top and Bottom Ch East and West sides Steel	b Replace Replace Rears 6-10 years Severe Painted	Length: Width: Height: Count: Total Qua	Maint Urge	24.38 0.051 0.102 16 160 s	ce Needs: 1 year [34 m m m m	
Element Groute Element Name Location: Material: Element Type Environment: Protection System Condition	Light cact dam	orrosion throughou hage at the end of or large at larg	b Replace rears 6-10 y	Length: Width: Height: Count: Total Qua Limited Ir	Maint Urge	24.38 0.051 0.102 16 160 s	ce Needs: 1 year 34 m m 2 m	☐ 2 year Performance
Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data:	Light cact dam ed Wor p: e: stem:	orrosion throughout age at the end of or the end or t	b Replace rears 6-10 y	Length: Width: Height: Count: Total Qua Limited Ir	Maint Urge ntity: spection	24.38 0.051 0.102 16 160 s	ce Needs: 1 year 34 m m 2 m	☐ 2 year Performance
Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data:	Light cact dam ed Wor p: e: stem:	orrosion throughou hage at the end of or large at larg	b Replace rears 6-10 y	Length: Width: Height: Count: Total Qua Limited Ir	Maint Urge ntity: spection	24.38 0.051 0.102 16 160 s	ce Needs: 1 year 34 m m 2 m	☐ 2 year Performance
Comments: per bay. Imp Recommend Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	Light c act dam ed Wor ip: e: istem: Light c	orrosion throughout hage at the end of or large at lar	b Replace Replace Rears 6-10 years 6-10 years Arears Replace Rears Arears Replace Replace Rears Replace Rears Replace Rears Replace Replace Rears Replace Repl	Length: Width: Height: Count: Total Qua Limited In Good 160 the top and b	Maint Urge ntity: aspection Fair	24.38 0.051 0.102 16 160 s	ce Needs: 1 year [34 m m m q. m	☐ 2 year Performance
Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data:	Light c act dam ed Wor ip: e: istem: Light c	orrosion throughout hage at the end of or ha	b Replace Replace Replace Rears 6-10 years Severe Painted Exc.	Length: Width: Height: Count: Total Qua Limited In Good 160 the top and bese	Maint Urge ntity: aspection Fair	24.38 0.051 0.102 16 160 s	ce Needs: 1 year 34 m m 2 m	☐ 2 year Performance

Red Rock Bridge No. 2

Element Data

Element Grou	ıp:	Trusses/Arches		Length:		1.17	5 m		
Element Nam	e:	Verticals/Diagonals	3	Width:		0.03	8 m		
Location:		East and West sides	3	Height:		0.07	6 m		
Material:		Steel		Count:		11 p	er panel, 176		
Element Type	e:			Total Qua	ntity:	63 sc	Į. m.		
Environment:	:	Benign / (Moderate	Severe	Limited In	spection				
Protection Sys	stem:	Hot dip galvanizing		1				Performance	
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies	
Data:	m²) m	/ each / % / all		62			1	16	
Comments: Light impact damage southwest end post. Recommended Work:									
Recommend	led Wo						ce Needs:		
		□ 1-5	years \Box 6-10	years	☐ Urge	ent	□ 1 year □	☐ 2 year	
Element Grou		Trusses/Arches		Langth					
Element Name		Connections		Length: Width:					
Location:	c.	East and West sides	Mark and the second	Height:					
Material:		Steel		Count:					
Element Type	١.	Panel pins		Total Qua	ntity:				
Environment:		Benign / Moderate	Severe			П			
Protection Sys		Hot dip galvanizing		Limited II	Limited Inspection Performance				
Condition	Jecini.	Units	Exc.	Good	Fair Poor			Deficiencies	
Data:	2/		LAC.	Good	I an	•	1 001	Denterences	
				00			1	1/	
		/ each (%) all	Wo missing co	99			1	16	
Comments:	One ba	cked-out panel in, t		tter pins.	B/F = 2 · · · · ·		-	16	
	One ba	cked-out panel in, t	ıb □ Repla	tter pins.			ce Needs:		
Comments:	One ba	cked-out panel in, t k: ⊠Reha ⊠ 1-5	ıb □ Repla years □ 6-10	ce years	Maint □ Urge		ce Needs:	16	
Comments:	One ba	cked-out panel in, t	ıb □ Repla years □ 6-10	ce years			ce Needs:		
Recommender Reinstall paner bolt.	One ba ed Wor el pins a	cked-out panel in, t k: ⊠Reha ⊠ 1-5	ıb □ Repla years □ 6-10	ce years			ce Needs:		
Comments: Recommend Reinstall pane	ed Wone ba	cked-out panel in, to the content of	ıb □ Repla years □ 6-10	ce years Fighten Length:			ce Needs:		
Recommender Reinstall paner bolt.	ed Wone ba	cked-out panel in, to the content of	ab □ Repla years □ 6-10 oins to secure. ☐	ce years Fighten Length: Width:			ce Needs:		
Recommender Reinstall pane bolt. Element Groutellement Name	ed Wone ba	cked-out panel in, to the content of	ab □ Repla years □ 6-10 oins to secure. ☐	ce years Fighten Length:		ent	ce Needs:		
Recommender Reinstall paner bolt. Element Grout Element Namer Location:	ed Wordel pins and the pins and	cked-out panel in, to the content of	ab □ Repla years □ 6-10 oins to secure. ☐	ce years Fighten Length: Width: Height:	□ Urge	ent	ce Needs: ☐ 1 year ☐		
Recommender Reinstall paner bolt. Element Grout Element Name Location: Material:	ed Wone ba	cked-out panel in, to the content panel in, to	b □ Repla years □ 6-10 oins to secure.	tter pins. ce years Fighten Length: Width: Height: Count:	□ Urge	4 per 68	ce Needs: ☐ 1 year ☐		
Recommender Reinstall paner bolt. Element Grout Element Name Location: Material: Element Type	ed Wone ba	cked-out panel in, to the content of	b	ter pins. ce years Fighten Length: Width: Height: Count: Total Qua	□ Urge	4 per 68	ce Needs: ☐ 1 year ☐		
Recommender Reinstall paner bolt. Element Grout Element Namer Location: Material: Element Type Environment:	ed Wone ba	k:	b	ter pins. ce years Fighten Length: Width: Height: Count: Total Qua	□ Urge	4 per 68	ce Needs: ☐ 1 year ☐	2 year	
Recommender Reinstall paner bolt. Element Grout Element Name Location: Material: Element Type Environment: Protection Sys	ed Wordel pins a	cked-out panel in, to the content of	b Repla years 6-10 oins to secure.	ce years Fighten Length: Width: Height: Count: Total Qua	Urge	4 per 68	ce Needs: ☐ 1 year ☐	2 year Performance	
Recommender Reinstall paner bolt. Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition	ed Wordel pins a	cked-out panel in, to the content of	b Repla years 6-10 oins to secure.	ter pins. ce years Fighten Length: Width: Height: Count: Total Qua Limited In	Urge	4 per 68	ce Needs: ☐ 1 year ☐	2 year Performance	
Recommender Reinstall paner bolt. Element Grout Element Namer Location: Material: Element Type Environment: Protection System Condition Data:	ed Wordel pins a price: m²/m¹	cked-out panel in, to the content of	Beplayears 6-10 bins to secure. Severe	ce years Fighten Length: Width: Height: Count: Total Qua Limited Ir	ntity: spection	4 per 68	ce Needs: 1 year transom Poor	2 year Performance	
Recommender Reinstall paner bolt. Element Grout Element Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	ed Wordel pins a price: m²/m¹	cked-out panel in, to the content of	B Replative Replace Re	ce years Fighten Length: Width: Height: Count: Total Qua Limited In Good 68	ntity: spection	4 per 68	ce Needs: ☐ 1 year ☐	2 year Performance	

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Red Rock Bridge No. 2

Element Data

Element Group		Bracing		Length:		5.105 m			
Element Name	:	Sway bracing		Width:		0.02	5 m diameter		
Location:		Underside of deck	between trusses	Height:					
Material:		Steel		Count:		2 pe	r panel		
Element Type:		Rod		Total Qua	ntity:	16			
Environment:		Benign / (Moderate	Severe	Limited I	nspection				
Protection Syst	em:	Hot dip galvanizing			Perfor				
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies	
Data:	m²/m	(each) % / all		16				16	
Comments: Light surface corrosion. Three loose braces.									
Recommende	d Woı	'k: ⊠ Reha ⊠ 1-5			Maint		ce Needs:	2 year	
Tighten loose l	bracin								
Element Group		Coatings		Length:					
Element Name:		Structural Steel		Width:					
Location:		Bailey bridge		Height:					
Material:		Steel		Count:					
Element Type:		Various		Total Qua	ntity:	223	sq. m.		
Environment:		Benign / Moderate		Limited Ir	spection				
Protection Syst	em:	Hot dip galvanizing	/Painted		Performance				
Condition		Units	Exc.	Good	Fair	r	Poor	Deficiencies	
Data: 🚺	m ² m	/ each / % / all		201	22	22			
Recommended			b □ Replace				ce Needs:	embers.	
		□ 1-5 y	ears 🗖 6-10 ye	ars	☐ Urge	nt	□ 1 year □	l 2 year	
		☐ 1-5 years ☐ 6-10 years							
E1		A1		T (1		0.45			
Element Group		Abutments		Length:		0.45			
Element Name:		Bearings		Width:		0.22	0 m		
Element Name: Location:		Bearings North and South ab	utments	Width: Height:		0.220	0 m 7 m		
Element Name: Location: Material:		Bearings North and South ab Steel		Width: Height: Count:		0.220 0.09' 4 eac	0 m		
Element Name: Location: Material: Element Type:		Bearings North and South ab Steel Pin and shoe bracket	et	Width: Height: Count: Total Qua		0.220 0.09° 4 eac 8	0 m 7 m		
Element Name: Location: Material: Element Type: Environment:		Bearings North and South ab Steel Pin and shoe bracke Benign / Moderate	Severe	Width: Height: Count:		0.220 0.09° 4 eac 8	0 m 7 m		
Element Name: Location: Material: Element Type: Environment: Protection System		Bearings North and South ab Steel Pin and shoe bracke Benign / Moderate Hot dip galvanizing	Severe	Width: Height: Count: Total Qua	spection	0.220 0.09° 4 eac 8	0 m 7 m ch abutment	Performance	
Element Name: Location: Material: Element Type: Environment: Protection Syste Condition	em:	Bearings North and South ab Steel Pin and shoe bracke Benign / Moderate Hot dip galvanizing Units	Severe	Width: Height: Count: Total Qua Limited In		0.220 0.09° 4 eac 8	0 m 7 m	Performance Deficiencies	
Element Name: Location: Material: Element Type: Environment: Protection Syste Condition Data:	em:	Bearings North and South ab Steel Pin and shoe bracke Benign / Moderate Hot dip galvanizing	Severe	Width: Height: Count: Total Qua	spection	0.220 0.09° 4 eac 8	0 m 7 m ch abutment		
Element Name: Location: Material: Element Type: Environment: Protection Syste Condition Data: Comments:	em:	Bearings North and South ab Steel Pin and shoe bracke Benign / Moderate Hot dip galvanizing Units each % / all	Severe Exc.	Width: Height: Count: Total Qua Limited In	rspection Fair	0.220 0.09' 4 eac 8	0 m 7 m ch abutment Poor		
Element Name: Location: Material: Element Type: Environment: Protection Syste Condition Data:	em:	Bearings North and South ab Steel Pin and shoe bracke Benign / Moderate Hot dip galvanizing Units each % / all k:	Exc. Barbara Replace	Width: Height: Count: Total Qua Limited In	Fair Maint	0.220 0.09' 4 eac 8	O m 7 m ch abutment Poor Ce Needs:		
Element Name: Location: Material: Element Type: Environment: Protection Syste Condition Data: Comments:	em:	Bearings North and South ab Steel Pin and shoe bracke Benign / Moderate Hot dip galvanizing Units each % / all	Exc. Barbara Replace	Width: Height: Count: Total Qua Limited In	rspection Fair	0.220 0.09' 4 eac 8	O m 7 m ch abutment Poor ce Needs:		

Red Rock Bridge No. 2

Element Data

	1.397 m			
Element Name: Bearings Width: 0.900 m				
Location: North and South abutments Height: 0.050 m				
Material: Steel Count: 2 each abutment				
Element Type: Base Plate Total Quantity: 4				
Environment: Benign / Moderate) Severe Limited Inspection				
Protection System: Paint	Performance			
Condition Units Exc. Good Fair Poor	Deficiencies			
Data: m ² /m (each)/ %/ all 4				
Comments: Gravel accumulation and light corrosion.				
Recommended Work:	18			
☐ 1-5 years ☐ 6-10 years ☐ Urgent ☐ 1 year ☐	2 year			
Remove gravel.	***************************************			
Element Group: Abutments Length: 7.000 m				
Element Name: Bearings Width: 0.300 m				
Location: North and South abutments Height: 0.300 m				
Material: Wood Count: 3 per abutment				
Element Type: Leveling pad Total Quantity: 6				
Environment: Benign / Moderate / Severe Limited Inspection				
Protection System: Penta	Performance			
Condition Units Exc. Good Fair Poor	Deficiencies			
Data: m ² /meach %/all 6				
Comments: Two large wood blocks at middle of bridge on leveling pad at north. Gravel acc	umulation.			
Recommended Work: Rehab Replace Maintenance Needs:				
☐ 1-5 years ☐ 6-10 years ☐ Urgent ☐ 1 year	☐ 2 year			
Remove gravel and wood	blocks.			
Element Group: Embankments and Streams Length:				
Element Name: Streams and waterways Width:				
Location: Height:				
Material: Count:				
Element Type: Total Quantity: All				
Environment: Benign / Moderate / Severe Limited Inspection				
Protection System:	Performance			
Condition Units Exc. Good Fair Poor	Deficiencies			
Data: m²/m/each/% all X				
Comments:				
Recommended Work:	18			
☐ 1-5 years ☐ 6-10 years ☐ Urgent ☐ 1 year ☐	rs ☐ Urgent ☐ 1 year ☐ 2 year Remove beaver dam			

Red Rock Bridge No. 2

Element Data

Element Group:	Embankments and S	Streams	Length:				
Element Name:	Embankments		Width:				
Location:	North and South em	ibankments	Height:				
Material:	Earth		Count:		6		
Element Type:			Total Qua	ntity:	6		
Environment:	Benign / Moderate	/ Severe	Limited Ir	spection			
Protection System:							Performance
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data: m ² / eac	ch / % /(all)		4			2	
Comments: Embankments appear to be stable. Erosion at southwest and north embankment.							
Recommended Wor						ce Needs:	
	☑ 1-5	years \square 6-10	years	☐ Urge	ent	□ 1 year □	2 year
Provide rock protection	on c/w geotextile.						
Element Group:	Embankments and S	Streams	Length:				
Element Name:	Slope Protection		Width:				
Location:	North and South em	bankments	Height:				
Material:			Count:		6		
Element Type:			Total Qua	ntity:	6		
Environment:	Benign Moderate	/ Severe	Limited In				
	Rock protection or north embankmen	•				tion at	Performance Deficiencies
Condition	Units	Exc.	Good	Fai	r	Poor	
Data: $m^2/m/$	each / % (all)		6				
Comments: Slope pr	rotection appears to	be stable and	effective.				
Recommended Wor	k: ☐ Rehal ☐ 1-5 y			Maint ☐ Urge		ce Needs:	☐ 2 year
Element Group:	Accessories	5	Length:				
Element Name:	Signs		Width:				
Location:			Height:				
Material:	Steel		Count:				
Element Type:			Total Qua	ntity:	8		
Environment:	Benign / Moderate	Severe	Limited In	spection			
Protection System:	Hot dip galvanizing	Painted	1100				Performance
Condition	Units	Exc.	Good	Fair	r	Poor	Deficiencies
Data: $m^2/m/$	each / % / all		6	1		1	16
Comments: Four Ha hazard sign is leaning					w Stru	cture signs.	Southwest
Recommended World	k: 🗆 Rehal	Replac	e	Maint	enan	e Needs:	18
	□ 1-5 ye	ears	ears	☐ Urge	nt [⊠ 1 year □	2 year
					1 L J C		

Element Data

Ontario Structure Inspection Manual – Inspection Form MTO Site Number: Red Rock Bridge No. 2

Element Gro	up:	Approaches		Length:		3.280 m			
Element Nam	ne:	Wearing Surface		Width:		3.65	8 m		
Location:		North and South ra	mps	Height:		0.04	5 m		
Material:		Wood	-	Count:		2			
Element Type	e:	Planks in herringbo	ne pattern	Total Qua	ntity:	24 sc			
Environment		Benign (Moderate		Limited I			1		
Protection Sy					Performance				
Condition		Units	Exc.	Good				Deficiencies	
Data:	m ² m	/each/%/all	DAC.	24	1 41		1001		
Comments:		7 00017 707 011		21					
Recommend	ded Wo	rk: Reh	ab 🔲 Replac	e	Main	tenan	ce Needs:		
		□ 1-5 y	ears	ears	☐ Urge	ent	□ 1 year □	2 year	
				_					
Element Gro		Approaches		Length:		3.65	8 m		
Element Nam	ne:	Approach ramp		Width:		0.152	2 m		
Location:		North and South ran	mps	Height:		0.043	5 m		
Material:		Wood		Count:		10 pc	er approach		
Element Type	e:	Timber Chesses		Total Qua	ntity:	73 m			
Environment	t:	Benign / Moderate) Severe	Limited In	Limited Inspection 🛛				
Protection Sy	stem:	CCA						Performance	
C 10.0		Units Exc.		~ .	Fair		70	Deficiencies	
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies	
Data:	m ² (m	each / % / all	Exc.	Good 73	Fai	Г	Poor	Deneteres	
		each / % / all	b □ Replace	73		tenan	ce Needs:	2 year	
Data: Comments: Recommend	ded Wo	each / % / all rk: □ Reha	b □ Replace	73	Main	tenan ent	ce Needs: ☐ 1 year ☐		
Data: Comments:	led Wo	rk: □ Reha □1-5 ye Approaches	b □ Replace	73 ars Length:	Main	tenan	ce Needs: ☐ 1 year ☐		
Data: Comments: Recommend Element Grown Element Nam	led Wo	rk: Reha 1-5 ye Approaches Approach span	b □ Replace ears □ 6-10 ye:	73 Length: Width:	Main	3.040 0.080	ce Needs: ☐ 1 year ☐ ☐ 0 m		
Data: Comments: Recommend Element Grow Element Nam Location:	led Wo	rk: Reha	b □ Replace ears □ 6-10 ye:	T3 Length: Width: Height:	Main	3.040 0.080 0.130	ce Needs: 1 year		
Data: Comments: Recommend Element Grown Element Nam Location: Material:	ded Wo	rk: ☐ Reha ☐ 1-5 ye Approaches Approach span North and South ran Steel	b □ Replace ears □ 6-10 ye:	T3 Length: Width: Height: Count:	Main □ Urge	3.040 0.080 0.130 5 per	ce Needs: 1 year		
Data: Comments: Recommend Element Grow Element Nam Location: Material: Element Type	up:	Peach / % / all Reha □1-5 ye Approaches Approach span North and South ran Steel I-type stringers	b □ Replace ears □ 6-10 year	Total Qua	Main Urge Urge	3.040 0.080 0.130 5 per 90 m	ce Needs: 1 year		
Data: Comments: Recommend Element Grow Element Nam Location: Material: Element Type Environment	up:	Approaches Approach span North and South ran Steel I-type stringers Benign / Moderate	b	T3 Length: Width: Height: Count:	Main Urge Urge	3.040 0.080 0.130 5 per 90 m	ce Needs: 1 year	2 year	
Data: Comments: Recommend Element Grown Element Nam Location: Material: Element Type Environment: Protection Sy	up:	Approaches Approach span North and South ran Steel I-type stringers Benign / Moderate Hot dip galvanizing	b	Length: Width: Height: Count: Total Qua	Maint □ Urgo ntity:	3.040 0.080 0.130 5 per 90 m	or Needs:	2 year Performance	
Data: Comments: Recommend Element Grown Element Nam Location: Material: Element Type Environment Protection Sy Condition	up: e: e:	Approaches Approaches Approach span North and South ran Steel I-type stringers Benign / Moderate Hot dip galvanizing Units	b	Total Qual Limited In	Main Urge Urge	3.040 0.080 0.130 5 per 90 m	ce Needs: 1 year	2 year	
Data: Comments: Recommend Element Grout Element Nam Location: Material: Element Type Environment Protection Sy Condition Data:	up: ne: e: rstem:	Approaches Approach span North and South ran Steel I-type stringers Benign / Moderate Hot dip galvanizing Units / each / % / all	b	Length: Width: Height: Count: Total Qua	Maint □ Urgo ntity:	3.040 0.080 0.130 5 per 90 m	or Needs:	2 year Performance	
Data: Comments: Recommend Element Grout Element Nam Location: Material: Element Type Environment Protection Sy Condition Data:	up: ne: e: rstem:	Approaches Approaches Approach span North and South ran Steel I-type stringers Benign / Moderate Hot dip galvanizing Units	b	Total Qual Limited In	Maint □ Urgo ntity:	3.040 0.080 0.130 5 per 90 m	or Needs:	2 year Performance	
Data: Comments: Recommend Element Grout Element Nam Location: Material: Element Type Environment Protection Sy Condition Data:	up: ne: e: cstem: Light c	Approaches Approaches Approach span North and South ran Steel I-type stringers Benign / Moderate Hot dip galvanizing Units / each / % / all corrosion throughou	b	Length: Width: Height: Count: Total Qua Limited Ir Good 90	Maint □ Urgo ntity: aspection	3.040 0.080 0.130 5 per 90 m	ce Needs: 1 year m m m m m approach Poor	2 year Performance	
Data: Comments: Recommend Element Ground Element Name Location: Material: Element Type Environment Protection Sy Condition Data: Comments:	up: ne: e: cstem: Light c	Approaches Approaches Approach span North and South ran Steel I-type stringers Benign / Moderate Hot dip galvanizing Units / each / % / all	b	Length: Width: Height: Count: Total Qua Limited Ir Good 90	Maint □ Urge ntity: spection Fai	3.040 0.080 0.130 5 per 90 m	ce Needs: 1 year m m m m m approach Poor	Performance Deficiencies	
Data: Comments: Recommend Element Ground Element Name Location: Material: Element Type Environment Protection Sy Condition Data: Comments:	up: ne: e: cstem: Light c	Approaches Approaches Approach span North and South ran Steel I-type stringers Benign / Moderate Hot dip galvanizing Units / each / % / all corrosion throughou	b	Length: Width: Height: Count: Total Qua Limited Ir Good 90	Maint □ Urgo ntity: aspection	3.040 0.080 0.130 5 per 90 m	ce Needs: 1 year m m m m m approach Poor	2 year Performance	

Ontario Structure Inspection Manual – Inspection Form MTO Site Number: Red Rock Bridge No. 2

Element Data

Element Grou	ıp:	Approaches		Length:		3.04	9 m	
Element Nam	e:	Approach span		Width:				
Location:		North and South ra	mps	Height:				
Material:		Wood	•	Count:		1 eac	ch end	
Element Type	:	Sleeper		Total Qua	ntity:	2		
	Environment: Benign / Moderate / Severe Limited							
Protection Sy	stem:	Penta			•			Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m ² / m	(each) % / all		2				
Comments:				,				
Recommend	led Wo		······	ace			ce Needs:	
		□ 1-5 y	years 🔲 6-10	years	☐ Urge	ent	□ 1 year □	2 year

Element Grou	ıp:	Approaches		Length:		3.04	0 m	
Element Nam	e:	Railing Systems		Width:				
Location:		North and South ap	proaches	Height:				
Material:		Wood and steel		Count:		2 per	r approach	
Element Type	:	Steel flex beam per	wood post	Total Qua	ntity:	13 m	1	
Environment	(Benign / Moderate	/ Severe	Limited Ir	spection			
Protection Sy	stem:	Penta/Hot dip galva	nizing					Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m ² (/m	each / % / all			13			08
connection to	Steel fl the bri	ex beam mounted a dge is improper. T pact damage at nor	wo rotated off	set timbers at	southwe	est ap	proach, 1 rot	
Recommend	ed Wo				Maint	tenan	ce Needs:	18
		⊠1-5 y	ears	years	☐ Urge	nt	⊠ 1 year 🛚 🖺	☐ 2 year
		roper elevation, ins			Tighter	n loos	se bolts.	
	•	l across structure.	Shim rotated o	ffsets.				
Replace one	guide ra	il section.						

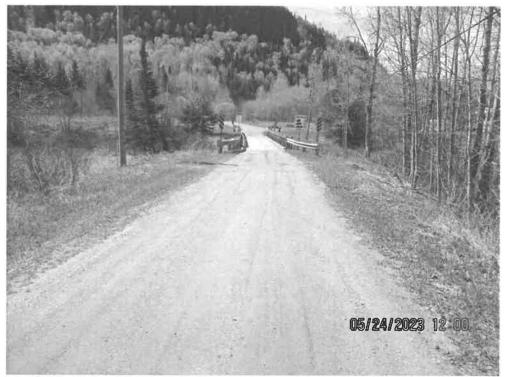


Photo 1: North approach.



Photo 2: South approach.



Photo 3: Upstream view.

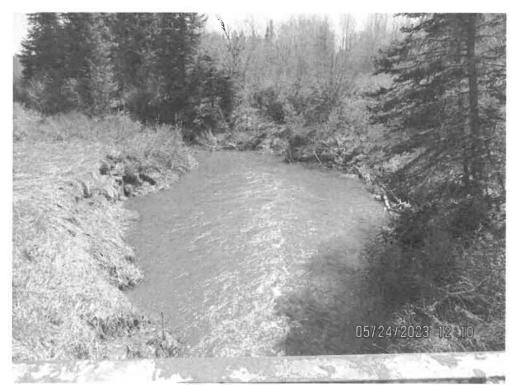


Photo 4: Downstream view.



Photo 5: Upstream elevation.



Photo 6: Downstream elevation.



Photo 7: Northeast embankment.



Photo 8: Southeast embankment.

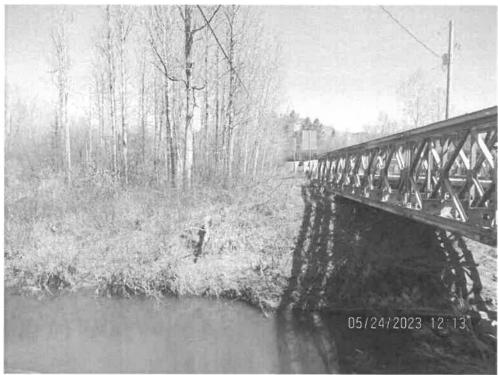


Photo 9: Northwest embankment.

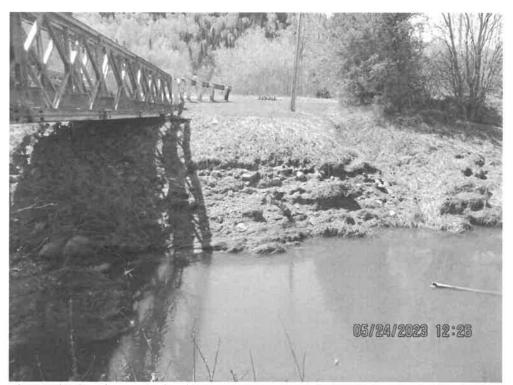


Photo 10: Southwest embankment.



Photo 11: Deck cross-section.



Photo 12: North abutment.



Photo 13: South abutment.



Photo 14: Underside of deck (typ.).



Photo 15: Loose/missing bolt at curb (typ.).



Photo 16: Improper connection of guide rail to bridge.



Photo 17: Loose panel pin.



Photo 18: Loose cotter pin/panel pin.

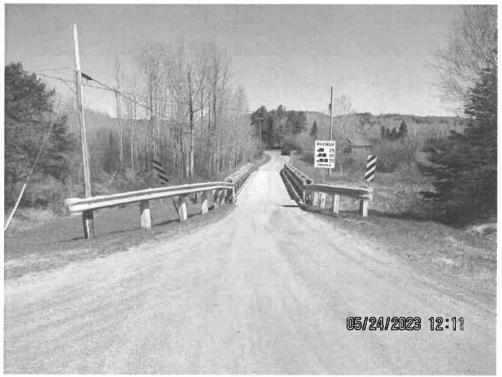


Photo 19: Guide rail mounted at improper height at southwest corner. Southwest Hazard Marker sign is leaning.

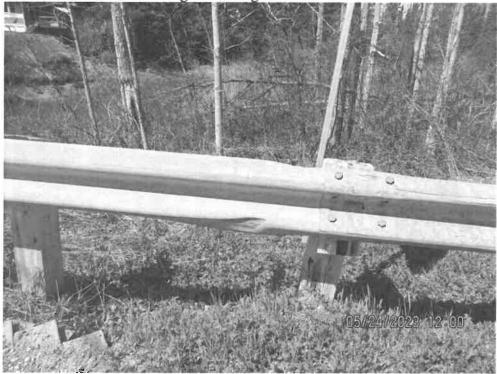


Photo 20: Guide rail splice bolts missing at all locations.



Photo 21: Impact damage at guide rail. Missing curb at 4 corners of approaches.

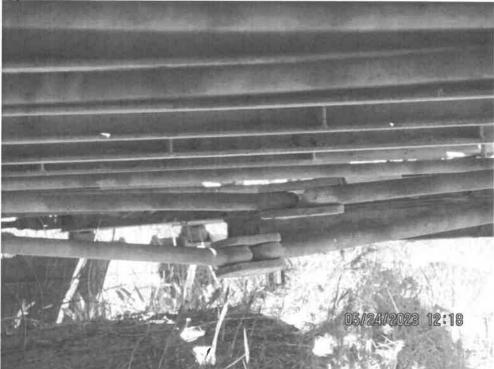


Photo 22: Loose sway bracing beneath bridge.



Photo 23: Medium corrosion at transom.



Photo 24: Loose curb bolts (typ.).



Photo 25: Severe rot at wearing surface.



Photo 26: Gravel accumulation at approach ramp.



Photo 27: Gravel accumulation at bearing timber (typ.).





Bi-annual Structural Inspection Red Rock Bridge No. 3

FOR THE TOWNSHIP OF RED ROCK



RED ROCK BRIDGE NO. 3 – BUCHANEN ROAD OVER TROUT CREEK

1.0 Description

Red Rock Bridge No. 3 is located on Buchanen Road over Trout Creek, approximately 0.2 kilometres south of Highway No. 628. The structure is load posted at 25/40/55 tonnes.

The structure is a single lane, single span, Double-Double Bailey Bridge with a timber deck and a longitudinal timber wear surface below the wheel locations. The deck is supported by steel stringers on steel transom beams. The ends of the transoms sit upon "double-double" preengineered steel trusses which bear upon steel base plates over timber levelling pads. The bridge span is 27.432 metres. The deck width between curbs is 3.3 metres.

2.0 Significant Findings

All cotter pins are missing at the top chords (32 total). One nut is missing, and one vertical bracing bolt is loose at a top chord connection. Three additional cotter pins are missing at the east side of the bridge.

The northeast bearing pin has shifted 75 mm.

The wearing surface planks flex when driven over. The ends are loose where sawcuts were made for previous stringer replacement.

Gravel has accumulated on the approach spans.

Severe rot was observed at the centre of one deck timber.

A few curb bolts were loose or missing.

Loose bolts were observed at the connection between the guide rail system and the trusses at 11 locations. There are only four bolts provided at each guide rail splice. The guide rail is not connected to a post at the southwest corner.

One bolt is missing at the top of the vertical bracing frame at the south end of the east truss.

Eight transom clamps are loose, and one is missing at the east side. 12 transom clamps are loose at the west side of the bridge.

Gravel has accumulated at the abutments bearings and levelling pads.

The north and south Narrow Bridge signs are blocked by vegetation.

Three Hazard Marker signs are loose/out of plumb.

Two stringer sets, at the eleventh and thirteenth transoms from the south end of the bridge are loose. One stringer, at the fifth transom from the south, is not fully bearing on a transom.

Vegetation growth was observed on the curbs. Impact damage was observed at the northeast and northwest curbs.

Very severe corrosion was observed at six approach span stringers.

Two rotated offset timbers were observed at the north approach guide rail. Two rotated offset timbers were observed at the south approach guide rail. One bolt is missing at the south approach west side railing system.

3.0 Conclusions and Recommendations

We recommend the following urgent remedial repairs be done within the next 1-3 months:

- Re-drive pin at northeast bearing.
- Provide all cotter pins at the top chords of the trusses. Provide one nut, and tighten one loose bracing bolt. Provide three additional cotter pins at the east side of the bridge.

We recommend the following remedial repairs be done within the next 1-2 years:

- Install new wearing surface planks over previous sawcut locations.
- Remove gravel accumulation from the approach spans.
- Tighten loose bolts and provide new nuts/bolts at the curb.
- Tighten all loose bolts between the guide rail system and the trusses. Provide proper number of bolts at all guide rail splices. Reconnect to one post.
- Provide one bolt at the top of the vertical bracing frame at the south end of the east truss.
- Tighten all loose transom clamps. Provide one transom clamp.
- Replace severely corroded stringer sets at both approaches. The deck wearing surface, and curbs will need to be removed and reinstalled to facilitate.
- Remove gravel accumulation from the bearing timbers and levelling pads.
- Remove vegetation in front of north and south Narrow Structure signs.

- Re-secure/plumb all Hazard Marker signs.
- Replace two sections of curb.
- Shim all loose offset timbers. Provide one bolt at railing system.

Since the severe rot observed at the deck timber is not located at a wheel location, this deck timber does not require replacement this time. If the rot progresses beneath the wearing surface or progresses to additional deck timbers, replacement may be required.

4.0 Estimated Construction Costs

The following are the estimated construction costs for the recommended remedial repairs:

Install new wearing surface planks over previous sawcut locations	\$ 2,500.00
Remove gravel accumulation at the ends of bridge	\$ 500.00
Tighten/provide bolts at curb	\$ 500.00
Tighten all loose bolts at guide rail to trusses connection	\$ 500.00
Provide proper number of bolts at guide rail splices	\$ 1,000.00
Provide one vertical bracing bolt	\$ 100.00
Provide all missing cotter pins, nuts, and tighten one bolt	\$ 900.00
Tighten loose transom clamps. Provide one transom clamp	\$ 1,000.00
Replace severely corroded stringer sets	\$ 17,000.00
Remove gravel from abutment bearing timbers and levelling pads	\$ 1,000.00
Re-drive pin at northeast bearing	\$ 200.00
Trim vegetation blocking Narrow Bridge signs	\$ 100.00
Reinstall three Hazard Marker signs	\$ 500.00
Replace two sections of curb	\$ 1,000.00
Shim loose offsets. Provide one bolt	\$ 300.00
Subtotal	\$ 27,100.00
Mob/Demob (15%)	\$ 4,100.00
Engineering and Contingency (35%)	\$ 10,000.00
Total Construction Cost Estimate	\$41,200.00 + HST

To achieve an unlimited load rating, two additional transom beams must be provided per panel (18 new transom beams total). To provide new transoms, the wearing surface and the deck will most likely require replacement, and the stringers must be removed to facilitate installation. The additional estimated construction cost to provide 18 new transoms is \$72,000.00 + HST.

The BCI is the ratio of the value of each bridge element in its current state to the total replacement value of the bridge. The overall Bridge Condition Index (BCI) of Red Rock Bridge No. 3 is 63. The BCI value of the bridge indicates the bridge is in poor to fair condition, and rehabilitation may be required to ensure the longevity of the structure.

Inventory Data:		
Structure Name	Red Rock Bridge No. 3	
Main Hwy/Road #	On ⊠ Under □	Crossing ☐ Navig. Water ☑ Non-Navig. Water Type: ☐ Rail ☐ Road ☐ Ped. ☐ Other
Hwy/Road Name	Buchanan Road	
Structure Location	0.2 km west of Hwy 628	
Latitude	48° 56' 16" N	Longitude 88° 18' 14" W
Owner(s)	Township of Red Rock	Heritage ☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. Designation: ☐ Desig./not List ☐ Desig. & List
MTO Region	Northwestern	Road Class: Freeway ☐ Arterial ☐ Collector ☐ Local ☑
MTO District	Thunder Bay	Posted Speed No. of Lanes 1
Old County	Thunder Bay	AADT % Trucks
Geographic Twp.		Inspection Route Sequence
Structure Type	Bailey - Double Double	Interchange Number
Total Deck Length	33.537 (m)	Interchange Structure Number
Overall Str. Width	5.49 (m)	Min. Vertical Clearance (m)
Total Deck Area	114.697 (sq.m)	Special Routes: □Transit □Truck □School □ Bicycle
Roadway Width	3.42 (m)	Detour Length Around Bridge (km)
Skew Angle	0 (Degrees)	Direction of Structure North to South
No. of Spans	One	Fill on Structure (m)
Span Lengths	27.432	(m)
Historical Data:	and the same	
Year Built		Year of Last Major Rehab. 2012
Last OSIM Inspection	2021	Last Evaluation 2009
Last Enhanced OSIM I	nspection	Current Load Limit 25 /40 / 55 (tonnes)
Enhanced Access Equal (ladder, boat, lift, etc.)		Load Limit By-Law #
Last Underwater Inspe	ection	By-Law Expiry Date
Last Condition Survey		
	ag Construction leveled bearing t transoms, stringers, north abuti	

Ontario Structure Inspection Manual – Inspection Form MTO Site Number: Red Rock Bridge No. 3 **Field Inspection Information:** Date of Inspection: May 24,2023 Type of Inspection: **⊠** OSIM ☐ Enhanced OSIM Inspector: Michael Edmonds, P.Eng., JML Engineering Others in Party: Mathew Currie, P.Eng., JML Engineering Access Equipment Used: Weather: Sunny 6° Celsius Temperature: Additional Investigations Required: **Priority** None Normal Urgent Material Condition Survey **Detailed Deck Condition Survey:** Non-destructive Delamination Survey of Asphalt-Covered Deck: Concrete Substructure Condition Survey: ✓ **Detailed Coating Condition Survey: Detailed Timber Investigation** Post-Tensioned Strand Investigation ✓ Underwater Investigation: Fatigue Investigation: / Seismic Investigation: Structure Evaluation: Monitoring Monitoring of Deformations, Settlements and Movements: **√** Monitoring Crack Widths: **Investigation Notes: Overall Structure Notes:** Recommended Work on Minor Rehab. ■ None ☐ Major Rehab. ☐ Replace Structure: Timing of Recommended Work: □ 1 to 5 years ☐ 6 to 10 years **Overall Comments:** Maintenance and minor rehabilitation are required. Date of Next Inspection: 2025 Suspected Deficiencies 06 Bearing not uniformly loaded/unstable Slippery surfaces Load carrying capacity 07 Jammed expansion joint 13 Flooding/channel blockage Excessive deformations (deflections & rotations) 08 Pedestrian/vehicular hazard 14 Undermining of foundation **N3** Continuing settlement 09 Rough riding surface Unstable embankments 15 04 Continuing movements 10 Surface ponding 16 Other Seized bearings Deck drainage 11 Maintenance Needs 01 Lift and Swing Bridge Maintenance 07 Repair to Structural Steel Erosion Control at Bridges Bridge Cleaning Repair of Bridge Concrete Concrete Sealing 14 03 Bridge Handrail Maintenance 09 Repair of Bridge Timber Rout and Seal

JML Ref. No. 2023013 Page 5

Animal/Pest Control

Bridge Surface Repair

Bailey Bridges - Maintenance

Bridge Deck Drainage

Scaling (Loose Concrete or ACR Steel)

16

17

Other

10

11

04

05

Painting Steel Bridge Structures

Bridge Deck Joint Repair

Bridge Bearing Maintenance

Element Gro		Decks		Length:			39 m	
Element Nan	ie:	Wearing Surface	Width:	2.43 m				
Location:			Height:		0.04	5 m		
Material:		Wood		Count:		6 pla	nks per whee	l location
Element Type				Total Qua	ntity:	67 s	j. m.	
Environment		Benign / Moderate	e (Severe)	Limited Ir	spection			
Protection Sy	stem:	CCA						Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data: (m ²) m / each / % / all 67								08
Comments: Planks flex when driven over. Sawcuts were made in wearing surface to replace stringers, ends of planks not nailed down. Gravel accumulation at ends of bridge.								
Recommend	ied Wo	***************************************	□ Replace				ce Needs:	09, 02
***************************************			-	S	☐ Urge	ent	⊠ 1 year [☐ 2 year
Install new p	lanks o	ver previous sawcu	it locations.		Re-fast	ten bo	oards. Remo	ve gravel
					accum	ulatio	n.	
Element Gro		Decks		Lametha		27.4	20	
Element Nam		Deck Top		Length: Width:		3.65		
Location:	ic.	Deck Top		Height:		0.04		
Material:		Wood		Count:			lanks per pane	al v O mamala
Element Type	ρ•	Wood Planks (timb	er chesses)	Total Qua	ntitue		sq. m	a x 9 paneis
Environment		Benign / Moderate		Limited In			sq. III	
Protection Sy		CCA	Bevele	Dimited II	spection			Performance
	Decam.		E	C 1	E-2	_	D	Deficiencies
f 'andifian								
Condition Data:		Units / each / % / all	Exc.	Good 100	Fai		Poor	08
Data: Comments:	Gravel	/ each / % / all accumulation at er	nds of bridge.	100 One deck tim	ber is se	verely	rotten at the	08 e centre.
Data:	Gravel	/ each / % / all accumulation at en	nds of bridge. (100 One deck tim	ber is se	verely	rotten at the	08 e centre.
Data: Comments:	Gravel	/ each / % / all accumulation at en	nds of bridge. (100 One deck tim	ber is se Maint	verely t enan ent	y rotten at the ce Needs: ☐ 1 year	08 e centre. 02 □ 2 year
Data: Comments:	Gravel	/ each / % / all accumulation at en	nds of bridge. (100 One deck tim	ber is se Maint	verely t enan ent	rotten at the	08 e centre. 02 □ 2 year
Data: Comments:	Gravel	/ each / % / all accumulation at en	nds of bridge. (100 One deck tim	ber is se Maint	verely t enan ent	v rotten at the	08 e centre. 02 □ 2 year
Data: Comments: Recommend	Gravel	/ each / % / all accumulation at er rk:	nds of bridge. (100 One deck tim ace years	ber is se Maint	verely tenan ent ve gra	v rotten at the	08 e centre. 02 □ 2 year
Data: Comments: Recommend	Gravel	/ each / % / all accumulation at er rk:	nds of bridge. (nab Replyears 6-10	100 One deck tim ace years Length:	ber is se Maint	tenan ent ve gra	v rotten at the	08 e centre. 02 □ 2 year
Data: Comments: Recommend Element Grown Element Nam	Gravel	/ each / % / all accumulation at en rk:	nds of bridge. (nab Replyears 6-10	100 One deck tim ace years Length: Width:	ber is se Maint	tenan ent re gra	v rotten at the	08 e centre. 02 □ 2 year
Data: Comments: Recommend Element Grot Element Nam Location: Material: Element Type	Gravel led Won	/ each / % / all accumulation at en rk: Ref 1-5 Sidewalks/Curbs Curbs Curbs East and West side Wood	nds of bridge. (nab Replyears 6-10	100 One deck tim ace years Length: Width: Height:	Maint ☐ Urg Remov	tenan ent ve gra 27.4: 0.152	y rotten at the ce Needs: ☐ 1 year vel accumula 39 2 m 2 m	08 e centre. 02 □ 2 year
Data: Comments: Recommend Element Grow Element Nam Location: Material: Element Type Environment	Gravel led Won up: lee:	/ each / % / all accumulation at end rk: Reh	nds of bridge. (nab Replyears 6-10	100 Dne deck tim ace years Length: Width: Height: Count:	Maint Urg Remov	zenan ent ze gra 27.4; 0.15; 0.15; 2	y rotten at the ce Needs: ☐ 1 year vel accumula 39 2 m 2 m	08 e centre. 02 □ 2 year ation.
Data: Comments: Recommend Element Grow Element Nam Location: Material: Element Type Environment Protection Sy	Gravel led Won up: lee:	/ each / % / all accumulation at end rk: Reh	nds of bridge. (nab Replyears 6-10	Length: Width: Height: Count: Total Qua	Maint Urg Remov	zenan ent ze gra 27.4; 0.15; 0.15; 2	y rotten at the ce Needs: ☐ 1 year vel accumula 39 2 m 2 m	08 e centre. 02 □ 2 year
Data: Comments: Recommend Element Grow Element Nam Location: Material: Element Type Environment Protection Sy Condition	Gravel led Won up: lee:	/ each / % / all accumulation at end rk: Reh	nds of bridge. (nab Replyears 6-10	Length: Width: Height: Count: Total Qua	Maint Urg Remov	27.4: 0.152 0.153	y rotten at the ce Needs: ☐ 1 year vel accumula 39 2 m 2 m	08 e centre. 02 □ 2 year ation.
Data: Comments: Recommend Element Grow Element Nam Location: Material: Element Type Environment Protection Sy	Gravel led Wor	/ each / % / all accumulation at end rk: Reh	nds of bridge. (nab Replyears 6-10)	Length: Width: Height: Count: Total Qua	Maint Urg Remov	27.4: 0.152 0.153	v rotten at the ce Needs: 1 year vel accumula 2 m m.	08 e centre. 02 2 year ation. Performance
Data: Comments: Recommend Element Grout Element Nam Location: Material: Element Type Environment Protection Sy Condition Data:	Gravel led Wor up: ie: : stem:	/ each / % / all accumulation at end rk: Ref	nds of bridge. (nab Replyears 6-10) Self Severe	Length: Width: Height: Count: Total Qua Limited In	Maint Urg Remov	27.4: 0.152 0.153	v rotten at the ce Needs: 1 year vel accumula 2 m m.	08 e centre. 02 □ 2 year ation. Performance Deficiencies
Data: Comments: Recommend Element Grout Element Nam Location: Material: Element Type Environment Protection Sy Condition Data:	led Won up: ee: stem: m² m A few	/ each / % / all accumulation at end rk: Reh	nds of bridge. (ab Replyears 6-10) Severe Exc.	Length: Width: Height: Count: Total Qual Limited In	Maint Maint Urg Remov	tenan ent ze gra 27.4: 0.152 0.152 17 sc	v rotten at the ce Needs: 1 year vel accumula 2 m m.	08 e centre. 02 □ 2 year ation. Performance Deficiencies
Data: Comments: Recommend Element Grow Element Nam Location: Material: Element Type Environment Protection Sy Condition Data: Comments:	led Won up: ee: stem: m² m A few	/ each / % / all accumulation at end rk:	nds of bridge. (nab	Length: Width: Height: Count: Total Qual Limited In	Maint Maint Urg Remov	tenan ent ze gra 27.4: 0.15: 0.15: 2 17 sc	v rotten at the ce Needs: 1 year vel accumula 2 m m. Poor	08 e centre. 02 2 year ation. Performance Deficiencies 08
Data: Comments: Recommend Element Grow Element Nam Location: Material: Element Type Environment Protection Sy Condition Data: Comments:	led Won up: ee: stem: m² m A few	/ each / % / all accumulation at end rk:	nds of bridge. (nab	Length: Width: Height: Count: Total Qual Limited In	Maint Urg Remov ntity: spection Fair	enan 27.4: 0.15: 0.15: 2 17 so	rotten at the ce Needs: 1 year vel accumula 2 m m. Poor ce Needs: 1 year	08 e centre. 02 □ 2 year ation. Performance Deficiencies 08

Element Grou	ıp:	Barriers		Length:		27.4	32 m	
Element Nam	e:	Railing Systems		Width:				
Location:		East and West sides	s of deck	Height:				
Material:		Steel		Count:		2 sid	les	
Element Type	e:	Steel flex beam alo Bridge	ng Bailey	Total Qua	ntity:	55 n	ı	
Environment:	:	Benign Moderate	Severe	Limited Ir	spection			
Protection Sy	stem:	Hot dip galvanizi	ng					Performance
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m ² (m	each / % / all		55				
Comments:		o medium corrosion	n and impact da	mage throug	hout. L	oose	bolts at conne	ection to trusses
		connected to post at						
		Eleven loose splice			F			
Recommend				ace	Main	tenan	ce Needs:	
***************************************		□ 1-5			Urg			2 year
***************************************	***************************************	***************************************		<u> </u>			se bolts and lo	
					connec		o o o o o o o o o o o o o o o o o o o	ocoo opnoe
					Comme			
Element Grou	ıp:	Beams/Main Longi Elements	tudinal	Length:		3.04	8 m	
Element Nam	e:	Stringers		Width:		0.04	5 m	
Location:		Deck		Height:		0.10	2 m	
Material:		Steel		Count:		3 per 9 spa		sets per span,
Element Type	e:	I-type complete wit	h diaphragms	Total Qua	ntity:	135		
Environment:	:	Benign / Moderate	Severe	Limited In	Limited Inspection			
Protection Sys				Performance				
Frotection Sys	stem:	Paint						Performance
Condition	stem:	Paint Units	Exc.	Good	Fai	r	Poor	Deficiencies
			Exc. 21	Good 63	Fai	r	Poor 6	
Condition Data:	m^2/m	Units /(each) % / all	21	63	45		6	Deficiencies
Condition Data: Comments:	m²/m Mediur	Units	21 served through	63 out the string	45 gers. So	me st	6 ringers have l	Deficiencies been replaced.
Condition Data: Comments: Fifth transom	m ² / m Medium	Units /(each)% / all n corrosion was ob orth and south strir	21 served through	63 out the string	45 gers. So missing	me st	6 ringers have l aragms there	Deficiencies been replaced. fore unbraced.
Condition Data: Comments: Fifth transom	m ² / m Medium from n es) and	Units /(each) % / all n corrosion was ob	21 served through	63 out the string	45 gers. So missing	me st	6 ringers have l aragms there	Deficiencies been replaced. fore unbraced.
Condition Data: Comments: Fifth transom 11th (both side	m ² /m Medium from n es) and span.	Units /(each)% / all n corrosion was ob orth and south strir 13 th stringer sets fr	21 served through ngers not bearing om north (sout	63 out the string ag, loose and h side) are lo	gers. So missing ose. On	me st diapl	6 ringers have l aragms there	Deficiencies been replaced. fore unbraced.
Condition Data: Comments: Fifth transom 11th (both side corroded mide)	m ² /m Medium from n es) and span.	Units /(each) % / all m corrosion was ob orth and south strin 13th stringer sets fr	21 served through ngers not bearin om north (sout	63 out the string ag, loose and h side) are lo	gers. So missing ose. On	me str diapl e strir	fringers have baragms therefringer set very	Deficiencies been replaced. fore unbraced.
Condition Data: Comments: Fifth transom 11th (both side corroded mide)	m ² /m Medium from n es) and span.	Units /(each) % / all m corrosion was ob orth and south strin 13th stringer sets fr	21 served through ngers not bearing om north (sout	63 out the string ag, loose and h side) are lo	gers. Some missing ose. On Maint	me str diapl e strir	fringers have baragms therefringer set very	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend	m ² /m Medium from n es) and span. ed Won	Units /(each) % / all n corrosion was ob orth and south strir 13th stringer sets fr k:	served through ngers not bearing om north (south the label of Replacement 1998) and 1998 are	63 out the string ng, loose and h side) are lo	gers. Some missing ose. On Maint	me str diapl e strir	fringers have baragms therefringer set very	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11th (both side corroded mide)	m ² /m Medium from n es) and span. ed Won	Units /(each) % / all m corrosion was ob orth and south strin 13th stringer sets fr	served through ngers not bearing om north (south the label of Replacement 1998) and 1998 are	63 out the string ag, loose and h side) are lo	gers. Some missing ose. On Maint	me str diapl e strir	fringers have bragms thereinger set very ce Needs:	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend	m²/m Medium from n es) and span. ed Won	Units /(each) % / all n corrosion was ob orth and south strir 13 th stringer sets fr k:	served through ngers not bearing om north (south the label of Replacement 1998) and 1998 are	63 out the string ng, loose and h side) are lo	gers. Some missing ose. On Maint	me st diapl e strin	fringers have bragms therefore set very ce Needs:	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11 th (both side corroded mid Recommend Element Ground	m²/m Medium from n es) and span. ed Won	Units /(each) % / all n corrosion was ob orth and south strir 13 th stringer sets fr k:	served through ngers not bearing om north (south the label of Replacement 1998) and 1998 are	63 out the string ng, loose and h side) are lo e ars Length:	gers. Some missing ose. On Maint	me strice	fringers have baragms therefore set very ce Needs: 1 year 4 m	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Nam	m²/m Medium from n es) and span. ed Won	Units /(each) % / all n corrosion was ob orth and south strin 13 th stringer sets fr k:	served through ngers not bearing om north (south the label of Replacement 1998) and 1998 are	63 out the string ig, loose and h side) are lo e ars Length: Width: Height: Count:	45 gers. Somissing ose. On Maint Urge	me strictenantent	fringers have baragms therefore set very ce Needs: 1 year 4 m	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Nam Location:	m²/m Medium from n es) and span. ed Won	Units /(each) % / all m corrosion was oborth and south strin 13th stringer sets fr k: Reha 1-5 y Beams/Main Longit Elements Transom Beams Deck Steel I-type	21 served through ngers not bearin om north (sout	63 out the string ig, loose and h side) are lo	45 gers. Somissing ose. On Maint Urge	me strictenantent	fringers have haragms therefore set very ce Needs: 1 year 4 m 4 m 7 panel	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Nam Location: Material: Element Type Environment:	m²/m Medium from n es) and span. ed Won ip:	Units /(each) % / all n corrosion was oborth and south strin 13th stringer sets fr k: Reha 1-5 y Beams/Main Longi Elements Transom Beams Deck Steel I-type Benign / Moderate	21 served through ngers not bearin om north (sout	63 out the string ig, loose and h side) are lo e ars Length: Width: Height: Count:	45 gers. So missing ose. On Maint Urge	me string diaphe string tenan ent 5.28-0.11-0.25-2 per 86 sc	fringers have haragms therefore set very ce Needs: 1 year 4 m 4 m 7 panel	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Name Location: Material: Element Type Environment: Protection Systems	m²/m Medium from n es) and span. ed Won ip:	Units /(each) % / all m corrosion was ob orth and south strin 13 th stringer sets fr k:	21 served through ngers not bearin om north (sout	63 out the string ig, loose and h side) are loose ars Length: Width: Height: Count: Total Quantimited In	45 gers. So missing ose. On Maint Urge	me string diaphe string tenan ent 5.28-0.11-0.25-2 per 86 sc	fringers have haragms therefore set very ce Needs: 1 year 4 m 4 m 7 panel	Deficiencies been replaced. fore unbraced. severely 1 2 year Performance
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Name Location: Material: Element Type Environment: Protection System Condition	m²/m Medium from n es) and span. ed Won ip:	Units /(each) % / all n corrosion was oborth and south strin 13th stringer sets fr k: Reha 1-5 y Beams/Main Longi Elements Transom Beams Deck Steel I-type Benign / Moderate	21 served through ngers not bearin om north (sout	63 out the string ig, loose and h side) are lo e ars Length: Width: Height: Count: Total Qua	45 gers. So missing ose. On Maint Urge	5.28- 0.11- 0.25- 2 per	fringers have haragms therefore set very ce Needs: 1 year 4 m 4 m 7 panel	been replaced. fore unbraced. severely
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Name Location: Material: Element Type Environment: Protection System Condition	m²/m Medium from n es) and span. ed Won ip: e:	Units /(each) % / all m corrosion was ob orth and south strin 13 th stringer sets fr k:	served through ngers not bearing om north (south ab Replace rears 6-10 years) Severe	63 out the string ig, loose and h side) are loose ars Length: Width: Height: Count: Total Quantimited In	yers. Somissing ose. On Maint Urge	5.28- 0.11- 0.25- 2 per	fringers have bragms therefore set very ce Needs: 1 year 4 m 4 m 5 panel 1, m.	Deficiencies been replaced. fore unbraced. severely 1 2 year Performance
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	m²/m Medium from n es) and span. ed Won ip: e: stem:	Units /(each) % / all n corrosion was oborth and south strin 13th stringer sets fr k: Reha 1-5 y Beams/Main Longin Elements Transom Beams Deck Steel I-type Benign / Moderate Paint Units // each / % / all eeling and light to a	21 served through ngers not bearin om north (sout ab	63 out the string ig, loose and h side) are loose ars Length: Width: Height: Count: Total Qual Limited In Good 46 on was obse	45 gers. So missing ose. On Maint Urge	me string diaphe string tenan ent 5.284 0.114 0.254 2 per 86 sc	fringers have haragms thereinger set very ce Needs: 1 year 4 m 4 m 7 panel 1. m.	Deficiencies been replaced. fore unbraced. severely 2 year Performance Deficiencies
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Nam Location: Material: Element Type Environment: Protection System Comments: have been rep	m²/m Medium from n es) and span. ed Won ip: e: stem: Paint polaced.	Units /(each) % / all n corrosion was oborth and south strin 13th stringer sets fr k: Reha	21 served through ngers not bearin om north (sout ab	63 out the string ig, loose and h side) are loose lo	45 gers. So missing ose. On Maint Urge ntity: spection Fair	string diaphe string tenan cent cent cent cent cent cent cent cen	fringers have bragms therefore set very ce Needs: 1 year 4 m 4 m panel m. Poor	Deficiencies been replaced. fore unbraced. severely 2 year Performance Deficiencies
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	m²/m Medium from n es) and span. ed Won ip: e: stem: Paint polaced.	Units /(each) % / all m corrosion was oborth and south strin 13 th stringer sets fr k:	21 served through ngers not bearing om north (south ab	63 out the string ig, loose and h side) are loose	45 gers. Soo missing ose. On Maint Urge ntity: spection Fain	ine strictenance s	fringers have bragms thereinger set very ce Needs: 1 year 4 m 4 m 7 panel 1, m. Poor out. Nine trance Needs:	Deficiencies been replaced. fore unbraced. severely 2 year Performance Deficiencies
Condition Data: Comments: Fifth transom 11th (both side corroded mid Recommend Element Ground Element Nam Location: Material: Element Type Environment: Protection System Comments: have been rep	m²/m Medium from n es) and span. ed Won ip: e: stem: Paint polaced.	Units /(each) % / all n corrosion was oborth and south strin 13th stringer sets fr k: Reha	21 served through agers not bearing om north (south ab	63 out the string ig, loose and h side) are loose	45 gers. So missing ose. On Maint Urge ntity: spection Fair	ine strictenance s	fringers have bragms therefore set very ce Needs: 1 year 4 m 4 m panel m. Poor	Deficiencies been replaced. fore unbraced. severely 2 year Performance Deficiencies

Element Group:	Trusses/Arches		Length:			27.432 m	
Element Name:	Top and Bottom Cl		Width:		0.05		
Location:	East and West side:	S	Height:		0.10	2 m	
Material:	Steel		Count:		9 par		
Element Type:			Total Qua		90 s	q. m.	
Environment:	Benign (Moderate) / Severe	Limited I	nspection			1/24
Protection System:	Paint			Performance			
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data: m/n	64	26					
Comments: Paint peeling and light to medium corrosion throug					act da	mage to flan	ge at top chord
of top truss at north	end, both west and	east trusses. F	East truss nor	th end lea	aning	1.7°.	-
Recommended W	ork: Reh	ab 🗆 Repla	ace	Maint	tenan	ce Needs:	
		years		Urge			2 year
		<u> </u>	<i>y</i>	1			2) 011
	T					2	
Element Group:	Trusses/Arches		Length:			8 m, 1.024 m	
Element Name:	Verticals/Diagonals		Width:		0.03		
Location:	East and West sides	3	Height:		0.07		
Material:	Steel		Count:			nels each side	
Element Type:			Total Qua			sq. m.	
Environment:	Benign / Moderate	Severe	Limited I	Limited Inspection			
Protection System:	Paint		- 1/1	cu.			Performance
Condition	Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data: m/r	n / each / % / all		192	75		8	01
	peeling and light to						
observed at the ver	tical bracing frame a	t the north end	of the east t	russ. A b	olt is	missing at th	ne top of the
vertical bracing fra	me at the south end o	of the east trus:	s. Damaged	gusset pl	ate, e	xterior truss,	at north end,
east side. Damages	appear to be minor.	<u>, </u>					
Recommended W	ork: 🛛 Reh			Maint	enan	ce Needs:	07
	⊠1-5 y	rears	years	☐ Urge	nt	□ 1 year □	2 year
Replace the missin	g fastener.				***************************************		
**** . A	T	112					
Element Group:	Trusses/Arches		Length:				
Element Name:	Connections		Width:				
Location:	East and West sides	}	Height:				
Material:	Steel		Count:				
Element Type:	Panel Pins	7.0	Total Qua		_		
Environment:	Benign / Moderate)/ Severe	Limited I	nspection	Ц_		T
Protection System:	Paint	-					Performance
Condition	Units	Exc.	Good	Fair	r	Poor	Deficiencies
	n / each / (%) all			80		20	01
Comments: All co side.	otter pins are missing	; at top chords	(32 total). T	hree add:	itiona	l missing cot	ter pins at east
Recommended W	ork: \square Reha	ab Rep	lace	Maint	enan	ce Needs:	10
	□ 1-5 ·			⊠ Urg		☐ 1 year	☐ 2 year
		/	· J			missing cott	
				_		pin back int	-
				unive	ancı	pin back in	to position.

Element Grou	up:	Trusses/Arches		Length:				
Element Nam		Connections	W11	Width:				
Location:		East and West sides	3	Height:				
Material:		Steel		Count:		4 cla	mps per trans	om, 19 transoms
Element Type	e:	Transom Clamps		Total Qua	ntity:	76	1.7	,
Environment		Benign / (Moderate	Severe	Limited Ir				
Protection Sy	stem:	Paint			Perfor			
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies
Data:	m^2/m	(each) % / all		54		_	22	01
	mments: East – 8 loose, 1 missing. West – 12 loose					-	22	
Comments: East – 8 loose, 1 missing. West – 12 loose.								
Recommend	led Wo				Maint	tenan	ce Needs:	10
		□ 1-5 y	/ears 🗆 6-10 y	rears	☐ Urge	ent	⊠ 1 year 🛛	2 year
					Tighte	n and	secure loose	transom clamps.
					Provid	e one	transom clan	mp.
F1	The control of the co	D :		T		5.10	-	
Element Grou		Bracing Sanaina		Length:		5.103	5 m diameter	
Element Nam Location:	ie:	Sway Bracing Underside of deck l		Width:		0.023	m diameter	
Material:		Steel	between trusses	Height:		2	1	
	•	Rod		Count:	4:4	_	panel	
Element Type Environment		Benign / Moderate) Carrana		Total Quantity: 18 Limited Inspection			
Protection Sy		Paint Paint) Severe	Limited In	Limited Inspection Performance			
Condition	stem:	Units	Exc.	Good Fair		r Poor		Deficiencies
							Denticiences	
	2,		Good		_			
Data:	m ² /m	(each) % / all	Exc.	Good	14	_	4	
Data: Comments:		(each) % / all			14		4	
Data:		(each) % / all	b □ Replace	÷	14	tenan	4 ce Needs:	
Data: Comments:		(each) % / all		÷	14	tenan	4 ce Needs:	☐ 2 year
Data: Comments:		(each) % / all	b □ Replace	÷	14	tenan	4 ce Needs:	☐ 2 year
Data: Comments: Recommend	led Wo	(each) % / all rk: □ Reha □ 1-5 y	b □ Replace	e ars	14	tenan	4 ce Needs:	☐ 2 year
Data: Comments: Recommend Element Grou	led Wor	(each) % / all rk: □ Reha □ 1-5 y Coatings	b □ Replace	ars Length:	14	tenan	4 ce Needs:	☐ 2 year
Data: Comments: Recommend Element Grou	led Wor	(each) % / all rk: □ Reha □ 1-5 y Coatings Structural Steel	b □ Replace	Length:	14	tenan	4 ce Needs:	☐ 2 year
Data: Comments: Recommend Element Grout Element Nam Location:	led Wor	(each) % / all rk: □ Reha □ 1-5 y Coatings Structural Steel Bailey Bridge	b □ Replace	Length: Width:	14	tenan	4 ce Needs:	I 2 year
Data: Comments: Recommend Element Groutelement Nam Location: Material:	led Wo	Coatings Structural Steel Bailey Bridge Steel	b □ Replace	Length: Width: Height: Count:	Maint	t enan ent l	4 ce Needs: ☐ 1 year □	☐ 2 year
Data: Comments: Recommend Element Groutelement Name Location: Material: Element Type	led Wor	Coatings Structural Steel Bailey Bridge Steel Various	b □ Replace	Length: Width: Height: Count: Total Qua	Maint Urge	tenanent	4 ce Needs:	☐ 2 year
Data: Comments: Recommend Element Groutelement Nam Location: Material: Element Type Environment:	up:	rk: Reha Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate	b □ Replace	Length: Width: Height: Count:	Maint Urge	tenanent	4 ce Needs: ☐ 1 year □	
Data: Comments: Recommend Element Groutelement Nam Location: Material: Element Type Environment: Protection Sy	up:	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted	b □ Replace years □ 6-10 ye	Length: Width: Height: Count: Total Qual	Maint ☐ Urge	tenancent	4 ce Needs: □ □ 1 year □	Performance
Data: Comments: Recommend Element Grout Element Nam Location: Material: Element Type Environment: Protection Systems Condition	up: ne: e: stem:	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted Units	b □ Replace	Length: Width: Height: Count: Total Qua	Maint Urge ntity: spection	365 s	dece Needs: ☐ 1 year	
Data: Comments: Recommend Element Groutelement Name Location: Material: Element Type Environment: Protection Sycondition Data:	led Wor	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted Units / each / % / all	b Replace rears 6-10 years Severe Exc.	Length: Width: Height: Count: Total Qual Limited In	Maint ☐ Urge	365 s	4 ce Needs: □ □ 1 year □	Performance
Data: Comments: Recommend Element Groutelement Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	led Wor	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted Units / each / % / all orrosion and some	b Replace years 6-10 ye Severe Exc. coating failure.	Length: Width: Height: Count: Total Qua: Limited In	Maint ☐ Urge ntity: spection Fair 130	365 s	dece Needs: ☐ 1 year ☐ ☐ 1 year ☐ ☐ ☐ 1 year ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Performance
Data: Comments: Recommend Element Groutelement Name Location: Material: Element Type Environment: Protection Sycondition Data:	led Wor	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted Units / each / % / all orrosion and some	b	Length: Width: Height: Count: Total Qual Limited In	Maint Maint Urge ntity: spection 130	365 s	d ce Needs: □ 1 year □ sq. m. Poor 130 ce Needs: □	Performance Deficiencies
Data: Comments: Recommend Element Groutelement Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	led Wor	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted Units / each / % / all orrosion and some	b	Length: Width: Height: Count: Total Qual Limited In	Maint ☐ Urge ntity: spection Fair 130	365 s	dece Needs: ☐ 1 year ☐ ☐ 1 year ☐ ☐ ☐ 1 year ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Performance
Data: Comments: Recommend Element Groutelement Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	led Wor	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted Units / each / % / all orrosion and some	b	Length: Width: Height: Count: Total Qual Limited In	Maint Maint Urge ntity: spection 130	365 s	d ce Needs: □ 1 year □ sq. m. Poor 130 ce Needs: □	Performance Deficiencies
Data: Comments: Recommend Element Groutelement Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	led Wor	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted Units / each / % / all orrosion and some	b	Length: Width: Height: Count: Total Qual Limited In	Maint Maint Urge ntity: spection 130	365 s	d ce Needs: □ 1 year □ sq. m. Poor 130 ce Needs: □	Performance Deficiencies
Data: Comments: Recommend Element Groutelement Name Location: Material: Element Type Environment: Protection System Condition Data: Comments:	led Wor	Coatings Structural Steel Bailey Bridge Steel Various Benign / Moderate Painted Units / each / % / all orrosion and some	b	Length: Width: Height: Count: Total Qual Limited In	Maint Maint Urge ntity: spection 130	365 s	d ce Needs: □ 1 year □ sq. m. Poor 130 ce Needs: □	Performance Deficiencies

Element Group		Coatings			Length:					
Element Name:		Railing system	c		Width:					
Location:	•	Approaches an			Height:					
Material:		Steel	d bridge		Count:					
Element Type:		Steel flex bean				454				
					Total Qua					
Environment:	_					nspection	ш		-1	
Protection Syst	em:	Hot dip galvanizing			Performance					
Condition		Units		Exc.	Good	Fai	r	Poor		Deficiencies
		/ each (% /)all			100					
Comments: Light corrosion throughout.										
Recommended	d Wor	rk:	Rehab	☐ Repla	ce	Main	tenan	ce Needs:		
***************************************			1-5 years	□ 6-10 y		☐ Urge	ent [☐ 1 year		2 year
						-			_	
Element Group):	Abutments			Length:		0.45	7 m		
Element Name:		Bearings			Width:		0.38	1 m		
Location:		North and Sou	th Abutme	ents	Height:		0.09	7 m		
Material:		Steel			Count:		2 eac	h abutment		
Element Type:		Pin and Shoe b	racket		Total Qua	ntity:	4			
Environment:		Benign / Mode		vere	Limited In					
Protection Syste	em:	Paint			1	Performance				
Condition	ciii.	Units		Exc.	Good	Fai	P.	Poor	-	Deficiencies
				EXC.	Good		1	1 001	-	
		(each) % / all		· D.	.1	4	. 1 1			06
Comments: P Southwest cotto					on normeas	at oracke	ı nas ı	loosened by	1 13	mm.
Recommended	d Wor	·k: □	Rehab	☐ Replac		Maint	tenan	ce Needs:		06
			1-5 years	☐ 6-10	years	☑ Urge	ent	☐ 1 year		2 year
						Drive p	oin ba			n. Remove
Element Group		Abutments		119	Length:		1.39	7	_	
Element Name:		Bearings	1 1 4		Width:		0.900		_	
Location:		North and Sout	in abutme	nts	Height:		0.050			
Material:		Steel			Count:			h abutment		
Element Type:		Base plate			Total Qua		4			
Environment:		Benign / Mode	erate / S	evere	Limited Ir	ispection			_	
Protection Syste	em:	Paint							_	Performance
Condition		Units		Exc.	Good	Fai	r	Poor		Deficiencies
		each) % / all				4				
Comments: P	aint pe	eeling with me	dium sur	face corros	sion. Accum	nulation	of gra	vel at north	wes	st abutment.
Recommended	d Wor	·k: 🗆	Rehab	Replac	e	Maint	enan	ce Needs:	T	06
	_		1-5 years			Urge		☑ 1 year	1	☐ 2 year
							e grav	vel off base	pla	

Element Grou		Abutments		Length:			0.3 m		
Element Nam	ie:	Bearings	Width:		7.0 m				
Location:		North and South ab	utments	Height:		0.300 m			
Material:		Wood		Count:		3 pe	r abutment		
Element Type		Leveling Pad		Total Qua					
Environment		Benign Moderate	/ Severe	Limited Ir	spection			W	
Protection Sy	stem:	Penta			Performance				
Condition		Units	Exc.	Good	Fai	r	Poor	Deficiencies	
Data:	III / III / Cucity / U/ UII							03	
Comments: Gravel accumulation at south leveling pad. Recommended Work: □ Rehab □ Replace Maintenance Needs: 18								18	
	100 1101	□ 1-5 y		*************************	Urge		1 year	2 year	
ļ		<u> </u>	years 10-10	years	L Oigo		□ т усаг	L Z year	
L									
Element Grou	up:	Embankments and	Streams	Length:					
Element Nam	ie:	Streams and Water	ways	Width:					
Location:			-	Height:					
Material:				Count:					
Element Type	e:			Total Qua	ntity:	All			
Environment	:	Benign / Moderate	/ Severe	Limited In	Limited Inspection				
Protection Sy	stem:				Performance				
Condition		Units	Exc.	Good	Fair		Poor	Deficiencies	
Data:	m ² /m	/ each / % (all)		X					
Recommend	led Woi	rk: □ Reha □ 1-5 y	1				ce Needs:] 2 year	
Element Grou	ın.	Embankments and	Straams	Longth					
Element Nam		Embankments and a	ou callis	Length: Width:					
Location:		North and South en	hankmente	Height:					
Material:		Earth	Ioankinchts	Count:		6			
Element Type	· ·	Lurur		Total Qua	ntity•	6			
Environment:		Benign / Moderate	/ Severe	Limited In					
Protection Sys		Denign / Moderate	/ Bevere	Limited III	spection			Performance	
Condition		Units	Exc.	Good	Fair	7.	Poor	Deficiencies	
Data:	m² / m	/ each / % (all)	EAC.	6	I ai	1	1 001		
		rosion at south emb	pankment.	0					
Recommend	ed Wor	·k: Reha	b 🔲 Repla	ce	Maint	enan	ce Needs:		
		□ 1-5 y			☐ Urge		☐ 1 year	☐ 2 year	
	☐ 1-5 years ☐ 6-10 years								

Element Data

Ontario Structure Inspection Manual – Inspection Form MTO Site Number: Red Rock Bridge No. 3 **Element Group:** Embankments and Streams Length: **Element Name:** Slope Protection Width: Location: North and South embankments Height: Material: Stones at North, Grass at South Count: 6 Element Type: **Total Quantity:** 6 **Environment:** Benign / Moderate / Severe Limited Inspection **Protection System:** Performance Deficiencies Units Condition Exc. Good Fair Poor Data: m²/m/each/%(all) 6 15 Comments: Slopes are stable. Recommended Work: ☐ Rehab ☐ Replace **Maintenance Needs:** ☐ 1-5 years ☐ 6-10 years ☐ Urgent ☐ 1 year ☐ 2 year Element Group: Signs Length: **Element Name:** Narrow Structure Signs Width: Location: 50 m from approaches Height: Material: Steel Count: 1 each approach Element Type: Hot dip galvanizing/Painted **Total Quantity:** Benign Moderate / Severe Limited Inspection **Environment: Protection System:** Hot dip galvanizing/Paint Performance Deficiencies Condition Units Exc. Good Fair Poor Data: m²/m /each)%/all 80 Comments: South approach sign covered by trees. North approach sign partially blocked by vegetation. Recommended Work: ☐ Rehab Replace Maintenance Needs: 18 ☐ 1-5 years ☐ 6-10 years ☐ Urgent □ 1 year ☐ 2 year Remove vegetation. **Element Group:** Length: Signs **Element Name:** Hazard Marker Signs Width: Location: Corners of Structure Height: Material: Steel Count: 1 each corner Element Type: **Total Quantity:** Benign / Moderate / Severe **Environment:** Limited Inspection **Protection System:** Hot dip galvanizing/Paint Performance **Deficiencies** Condition Units Exc. Good Fair Poor Data: m²/m/each)%/all 4 08 Comments: Northeast, southwest, and southeast signs are loose. Recommended Work: Rehab ☐ Replace **Maintenance Needs:** 18 ☐ 1-5 years ☐ 6-10 years ☐ Urgent □ 1 year ☐ 2 year Re-align signs vertically.

Element Group:	Approaches		Length:	Length:		3.280 m		
Element Name:	Wearing Surface				2.40 m			
Location:	North and South ran	mps	Height:		0.045 m			
Material:	Wood		Count:		6 planks per wheel location		location	
Element Type:	Longitudinal planks	s at running	Total Qua	intity:	16 sq. m.			
Environment:	Benign / Moderate							
Protection System:	CCA						Performance	
Condition	Units					Poor	Deficiencies	
Data: (m ²)/m	n / each / % / all	16						
Comments:								
Recommended Wo	***************************************	h			_	ce Needs:		
	□ 1-5 y	ears	ears	Urg	ent	□1 year □	2 year	
Element Group:	Approaches		Length:		3.65	8 m		
Element Name:	Approach Span		Width:		0.15			
Location:	North and South rai	mns	Height:		0.04			
Material:	Wood		Count:			er approach		
Element Type:	Timber Chesses		Total Qua	ntity:		q. m.		
Environment:	Benign / Moderate	Severe		Limited Inspection				
Protection System:	CCA						Performance	
Condition	Units	Exc.	Good	Good Fair		Poor	Deficiencies	
Data: m/m	/ each / % / all		73		1 411			
Comments: Recommended Wo	rk: □ Reha	b □ Repla	ace.	Maint	enan	ce Needs:		
	□ 1-5 y			Urge			2 year	
/			<i></i>				2) (41	
Element Group:	Approaches		Length:		3.040			
Element Name:	Approach Span		Width:		0.080			
Location:	North and South ran	nps	Height:		0.130			
Material:	Steel		Count:			er approach		
Element Type:	I-type stringers		Total Qua		90 m			
Environment:	Benign / Moderate) Severe	Limited Ir	spection				
Protection System:	Painted						Performance	
Condition	Units	Exc.	Good	Fair	r	Poor	Deficiencies	
)/ each / % / all			70		20	01	
Comments: Medium	•		_					
flange reduced to 72				1			eb at north end.	
Recommended Wo						ce Needs:		
			years	☐ Urge	nt	☐ 1 year	☐ 2 year	
Replace severely con	roded stringer sets	at both approa	ches.					

Element Grou	up:	Approaches			Length:				
Element Nam		Approach span			Width:		4.0 1	n	
Location:		North and South ran	mps		Height:		110		
Material:			Wood Count:				1 ea	ch end	
Element Type				ntity:	2	011 0110			
Environment		Benign Moderate) / Sev	/ere	Limited In				
Protection Sy		Penta				Performance			
Condition		Units	E	xc.	Good	Fai	r	Poor	Deficiencies
Data:					2				
Comments: Wood sleeper is buried.									
Recommend	led Wo	rk: 🔲 Reha	ab	☐ Repla	ce	Main	tenan	ce Needs:	
		□ 1-5 y	ears	□ 6-10 y	ears ears	☐ Urg	ent	☐ 1 year	☐ 2 year
Element Grou	up:	Approaches		A 444	Length:		3.04	9 m	
Element Nam		Curbs			Width:		0.15		
Location:		North and South ran	nps		Height:		0.15		
Material:		Wood			Count:		_	r approach	
Element Type	3:				Total Qua	ntity:	4 sq.		
Environment:		Benign / Moderate	Seve	re		Limited Inspection			
Protection Sy	stem:	CCA			*				Performance
Condition		Units	E	xc.	Good	Fai	r	Poor	Deficiencies
	(m²)/ m	/ each / % / all			4	1 447	_	1001	
corner. Two	damage	tion growth on north				urbs loo	se at s	southwest ar	nd southeast
Recommend	led Woi	rk: □ Reha		Repla 🛚		Main	tenan	ce Needs:	18
		☑ 1-5 y	ears	🗆 6-10 у	ears	☐ Urge	ent	□ 1 year	☐ 2 year
Replace 2 sec	ctions o	f curb.							rbs. Refasten loose
						curb se	ctions.		
Element Grou	ıp:	Approaches	- 54		Length:		6.0 r	n	
Element Nam		Railing Systems			Width:		0.0.		
Location:		North and South ap	proach	es	Height:				
Material:		Wood and Steel			Count:		2 per	r approach	
Element Type	:	Steel flex beam on v	wood p	ost	Total Qua	ntity:	24 m		
Environment:		Benign Moderate	/ Sev	ere	Limited Ir				
Protection Sys	stem:	Hot Dip galvanizing	3			•			Performance
Condition		Units	E	xc.	Good	Fai	r	Poor	Deficiencies
Data:	m ² (m	each / % / all				24			08
Comments:	Light to	o medium corrosion	and in	mpact da	mage to stee	el beam	guide	rail. Two re	
		ne rotated southeas							
Recommend				☐ Replac				ce Needs:	
		⊠1-5 y		□ 6-10 y		□ Urge		□ 1 year	☐ 2 year
Provide bolt.	Re-plu	mb offset timbers.		······································					



Photo 1: North approach.



Photo 2: South approach.



Photo 3: Upstream view.

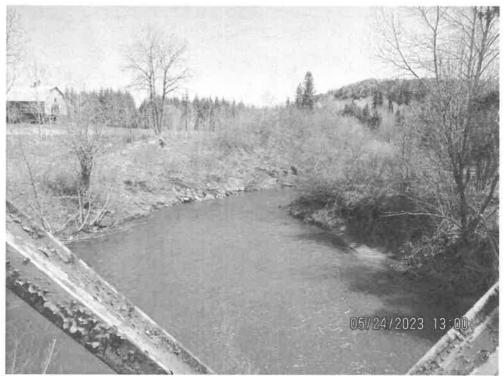


Photo 4: Downstream view.



Photo 5: Upstream elevation.



Photo 6: Downstream elevation.



Photo 7: Northeast embankment.



Photo 8: Southeast embankment.



Photo 9: Northwest embankment.



Photo 10: Southwest embankment.



Photo 11: Deck cross-section.



Photo 12: North abutment.



Photo 13: South abutment.



Photo 14: Underside of deck (typ.).

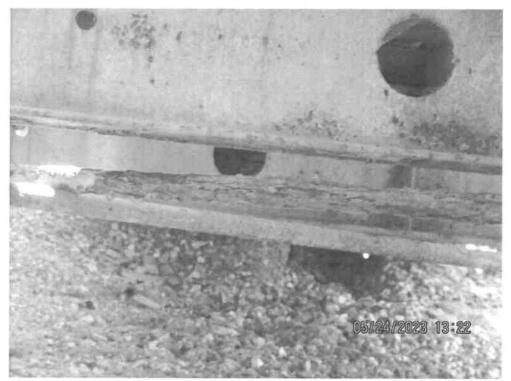


Photo 15: Severe corrosion at diagonal bracing at south end.



Photo 16: Loose bolt at curb (typ.).



Photo 17: Rotated offset (typ.).

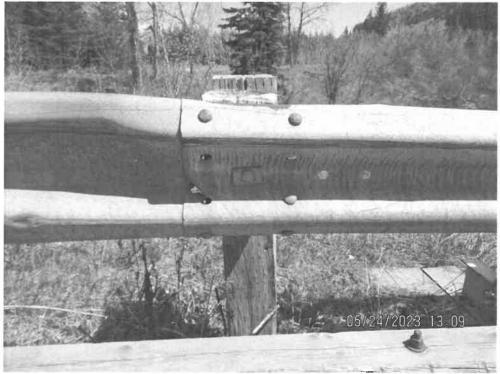


Photo 18: Missing bolts at guide rail splice (typ.).



Photo 19: Missing transom clamp at east side.



Photo 20: Severely corroded stringers (typ.).



Photo 21: Stringer set not bearing on transom.



Photo 22: Severe corrosion at end diaphragm of stringer set.



Photo 23: Gravel accumulation at abutment (typ.).



Photo 24: Severe impact damage at curb.

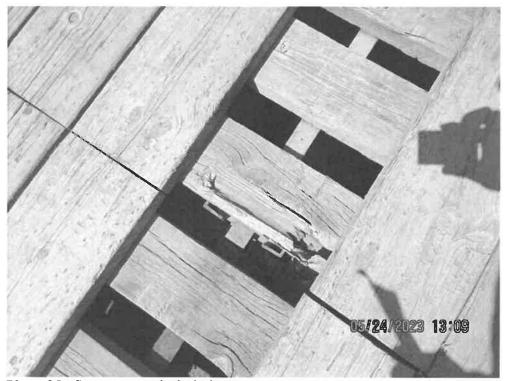


Photo 25: Severe rot at deck timber.



Photo 26: Gravel accumulation at approach (typ.).

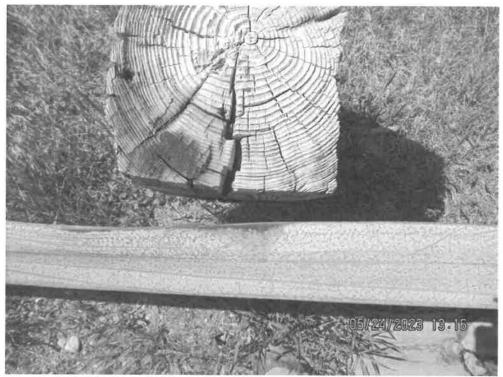


Photo 27: Missing thru bolt at guide rail south approach.



Photo 28: Missing truss brace bolt at southeast corner.

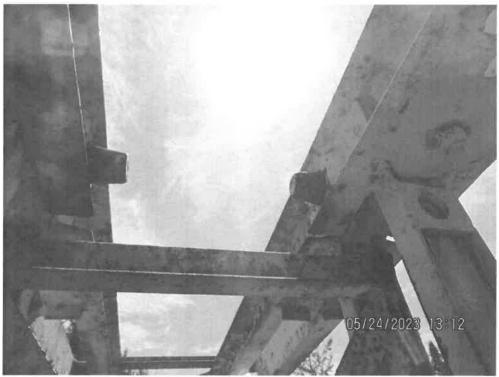


Photo 29: Missing cotter pins at panel pins (typ.).

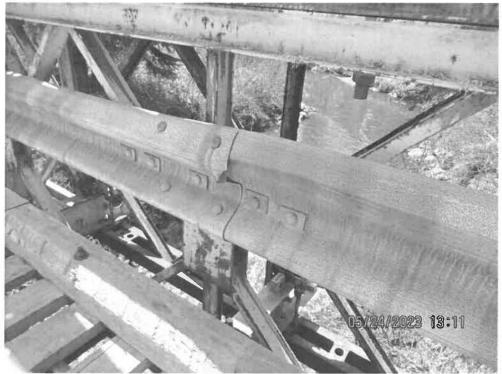


Photo 30: Impact damage at curb and guide rail.