Ontario Structure Inspection Manual – Inspection Form **MTO Site Number:** 38S-234

Inventory Data:

Structure Name	#19 Dean Lake Bridge				
Main Highway #	N/A	On ☒ or Under ☐ Structure	Service on structure:	☒ Navig. Water ☐ Non-Navig. Water ☐ Rail ☐ Road ☒ Ped. ☐ Other	
Location description	Dean Lake Road, 100m South of Highway 17		Service under	☐ Navig. Water ☐ Non-Navig. Water ☐ Rail ☐ Road ☐ Ped. ☐ Other	
Owner/Custodian	Municipality of Huron Shores		LHRS:		LHRS offset:	
MTO Region	50 - Northern		Latitude:	46 14.6'	Longitude:	83 9'
Regional Engineer			Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List	
MTO Area	62 - Sault Ste. Marie		Hwy Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☒	
Old County	38 - Algoma		Posted Speed	15 km/h	No. of Lanes	-
Township	Unknown		AADT	150	% Truck	10
Structure Type 1	33 - Through Truss		Travel Stream		
Structure Material 1			Traffic Directional Bound	N to S	
Structure Type 2			Inspection Route Sequence		
Structure Material 2			Inspection Frequency	2	(years)
Total Deck Length	111.2 (m)		Inspection Year	2021	
Overall Str. Width	4.9 (m)		Inspection Duration		(hrs)
Culvert length	(m)		Interchange Number		
Total Deck Area	544.8 (sq.m)		Interchange Structure Number		
Roadway Width	4.0 (m)		Min. Vertical Clearance	5.5	(m)
Skew Angle	0 (Degree)		Detour Distance	17.4	(km)
No. of Spans	3		Fill on Structure	0	(m)
Span Lengths	37.0+/-				(m)

<u>For retaining wall:</u>

Total Wall Length	(m)		Max. Wall Height		(m)
Total Wall Area	(sq.m)		Ave. Wall Height		(m)
			Angle of Backfill		(Degree)

Rev 2018

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Rev 2018

Historical Data:

Year Built	1908	Year of superstruct. constructed	N/A
Last Reg OSIM Inspection	2019	Year of Last Minor Rehab.	N/A
Last Enh. OSIM Inspection	2019	Year of Last Major Rehab.	2008
		Current Load Limit	10 / / (tonnes)

Work History: (Date/description)

2008 - Rehabilitation (Beams replaced and RFP deck installed, bridge painted, bracing under deck removed.

Rev 2018

Investigation History: (Date/description)

Detailed structural review completed in 2019 - 10 tonne load posting.

Scheduled Improvements:

Regional Priority Number

Programmed Work Year

Nature of Program Work:

Appraisal Indices:		Comments
Fatigue		
Seismic		
Scour		
Flood		
Barrier		
Curb		
Load Capacity		

Field Inspection Information:			
Date of Inspection:	2023-07-21	Type of Inspection:	☒ Reg. OSIM ☐ Enh. OSIM
Inspected By:	Matt Kirby, P. Eng		
Others in Party:	Danny McNeil, P. Eng / Matt Tremelling - Inspector Assistant		
Enh. Access Equipment:	Hammer, measuring tape, camera		
Special Access Equipment:			
Weather:	Sun/Clouds	Temperature: 20 C	

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey	X		
Detailed Deck Condition Survey:			X
Non-destructive Delamination Survey of Asphalt-Covered Deck:	X		
Concrete Substructure Condition Survey:			X
Detailed Coating Condition Survey:	X		
Detailed Timber Investigation	X		
Post-Tensioned Strand Investigation	X		
Underwater Investigation:	X		
Fatigue Investigation:	X		
Seismic Investigation:	X		
Structure Evaluation:		X	
Monitoring	X		
Deformations, Settlements and Movements:		X	
Crack Widths:		X	
RSS Horizontal movements of face:	X		
RSS Vertical movements of overall structure:	X		
RSS Local movements or deterioration of facing elements:	X		
RSS Horizontal movements within overall structure:	X		
RSS Vertical movements within overall structure:	X		
RSS Lateral earth pressure at the back of facing elements:	X		
Investigation Notes: Structure evaluation/Steel Condition Survey completed August of 2019.			

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☒ Major Rehab. ☐ Replace
Timing of Recommended Work:	☒ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	Bridge requires minor maintenance items within a year plus plans for major rehab staged over the next 3 years.
Date of Next Inspection:	2024

Suspected Performance Deficiencies

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

Maintenance Needs

01 N/A
02 Bridge Cleaning
03 Railing System Repair
04 N/A
05 Bridge Deck Joint Repair
06 N/A
07 Structural Steel Repair
08 Concrete Repair
09 Timber Repair
10 Works for Modular bridges
11 Animal/Pest Control
12 Bridge Surface Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 N/A
16 Works for Drainage System
17 Scaling (Loose Concrete or ACR Steel)
18 Other Maintenance

Element Data

Element Group:	Decks	**Length:**	111.2 m
Element Name:	Wearing Surface	**Width:**	4.13 m
Location:	Deck Surface	**Height:**	0.0 m
Material:	Asphalt	**Count:**	1
Element Type:		**Total Quantity:**	459.3 sq.m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☐**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		358.0	70.0	31.3	09

Comments:
Light deck wear throughout, light to medium transverse cracking, localized delamination at deck joints, patches at intermediate deck joints, patches and wheel rutting at northern span, localized potholes.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☒ Rehab ☐ Replace ☒ 1-5 years ☐ 6-10 years Repair deck slab wearing surface	☐ Urgent ☐ 1 year ☐ 2 year

Patches, Wheel Rutting and Ponding Water on North Span

Element Data

Element Group:	Decks	**Length:**	111.2 m
Element Name:	Deck Top	**Width:**	4.13 m
Location:		**Height:**	0.13 m
Material:	Fiberglass wrapped timber deck	**Count:**	1
Element Type:		**Total Quantity:**	459.3 sq.m
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☒**
Protection System:	Fibreglass		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	(m²) / m / each / % / all		439.3	10	10	11

Comments:
Light to medium transverse cracking, localized delamination at deck joints and light wear throughout. Active wet areas. Deck joints in poor condition.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None	

Large Potholes, De-bonding and Transverse Cracking in Overlay

Element Data

Element Group:	Decks	**Length:**	2.00 m
Element Name:	Soffit	**Width:**	3.50 m
Location:	Ends	**Height:**	-
Material:	Timber/Fiberglass Composite	**Count:**	2
Element Type:		**Total Quantity:**	14 sq.m
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☒**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	(m²) / m / each / % / all		7	7		00. None

Comments:
Water staining present, difficult to know if staining is epoxy within the panels or on the soffit surface.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years None	☐ Urgent ☐ 1 year ☐ 2 year

Typical Deck Soffit End

Element Data

Element Group:	Decks	**Length:**	109.2 m
Element Name:	Soffit	**Width:**	2.50 m
Location:	Interior	**Height:**	-
Material:	Timber/Fiberglass Composite	**Count:**	1
Element Type:		**Total Quantity:**	273.0 sq.m
Environment:	(Benign) / Moderate / Severe	**Inspected:**	Yes ☒ No ☐ Limited ☒
Protection System:			

Rev2008

Condition Data:	Units	Exc.	Good	Fair	Poor*	Perform. Deficiencies
	(m²) / m / each / % / all		91	91	91	00. None

Comments:
Fiberglass has localized loss of resin directly below deck panel joint. Typical at all panel joint locations.

Rev2008

Recommended Work:	☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	**Maintenance Needs:** 01. N/A ☐ Urgent ☐ 1 year ☐ 2 year
None		

Deck Soffit General Arrangement (looking north)

Element Data

Element Group:	Decks	**Length:**	109.2 m
Element Name:	Soffit	**Width:**	0.50 m
Location:	Exterior	**Height:**	-
Material:	Timber/Fiberglass Composite	**Count:**	2
Element Type:		**Total Quantity:**	109.2 sq. m
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☒**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	(m²) / m / each / % / all		36.4	36.4	36.4	00. None

Comments:
Two most northern deck panels were found to have water residing within the panels (2019). All other panels had no traces of moisture.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None	

Element Data

Element Group:	Beams/MLE's	**Length:**	2.0 m (Average)
Element Name:	Stringers	**Width:**	-
Location:	Ends	**Height:**	.21
Material:	Steel	**Count:**	24
Element Type:	I Type	**Total Quantity:**	24 (each)
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:	Painted		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m /(each) / % / all			20	4	00. None

Comments:
Localized medium to severe corrosion at abutment/pier bearing locations with perforations noted at south and north abutments (east sides only).

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☒ Rehab ☐ Replace ☒ 1-5 years ☐ 6-10 years Steel reinforcing required within 1 year.	☐ Urgent ☐ 1 year ☐ 2 year

Localized Severe Corrosion and Cracking in Web of Exterior Stringer at North Abutment

Element Data

Element Group:	Beams/MLE	**Length:**	33 m
Element Name:	Stringers	**Width:**	-
Location:	Middle	**Height:**	0.21 m
Material:	Steel	**Count:**	12
Element Type:	I Type	**Total Quantity:**	12 (each)
Environment:	**Benign** / **Moderate** / **Severe**	**Inspected:**	**Yes** ☐ **No** ☐ **Limited** ☒
Protection System:	Painted		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all			12		00. None

Comments:
Localized medium to severe corrosion at connection locations. Light corrosion throughout. Crack at bearing plates where the stringer sits on the transverse floor beam on the west exterior stringer at the first vertical from the north pier.

Rev2008

Recommended Work:	**Maintenance Needs:** 07. Structural Steel Repair
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☒ Urgent ☐ 1 year ☐ 2 year
None	Repair Cracked weld

Steel Stringers within Middle Sections

Element Data

Element Group:	Beams/MLE	**Length:**	0.15 m
Element Name:	Floor Beams	**Width:**	0.50 m
Location:	Ends	**Height:**	0.46 m
Material:	Steel	**Count:**	36
Element Type:	I Type	**Total Quantity:**	21.8 sq.m
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☒**
Protection System:	Painted		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	(m²) / m / each / % / all			19.2	2.6	00. None

Comments:
Light to medium corrosion, localized rust jacking at floor beam to truss vertical connection(s), Top flange has severe localized corrosion, pitting and staining.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None	

Typical Floor Beam - Pitting and Flaking Present on End Sections

Element Data

Element Group:	Beams/MLE	**Length:**	0.2 m
Element Name:	Floor Beams	**Width:**	3.83 m
Location:	Middle	**Height:**	0.46 m
Material:	Steel	**Count:**	18
Element Type:	I Type	**Total Quantity:**	83.4 sq.m
Environment:	**Benign** / **Moderate** / **Severe**	**Inspected:**	**Yes** ☒ **No** ☐ **Limited** ☒
Protection System:	Painted		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / **m** / **each** / **%** / **all**			81.3	2.1	00. None

Comments:
Light to medium corrosion throughout, Top flange has moderate to severe localized corrosion and pitting.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None.	

Staining of Floor Beams at Edges of Deck (staining below shim plates under exterior stringers)

Element Data

Element Group:	Piers	**Length:**	1.30 m
Element Name:	Shafts/Columns/Pile Bents	**Width:**	6.20 m
Location:	Intermediate Piers	**Height:**	4.44 m
Material:	Concrete	**Count:**	2
Element Type:	Concrete Shafts/Pier Walls	**Total Quantity:**	133.2 sq.m
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	(m²) / m / each / % / all			117.2	16	00. None

Comments:
Medium scaling, medium to wide cracking with staining, localized spall at South pier bearing, localized spalls in pier faces. Delaminations noted throughout.

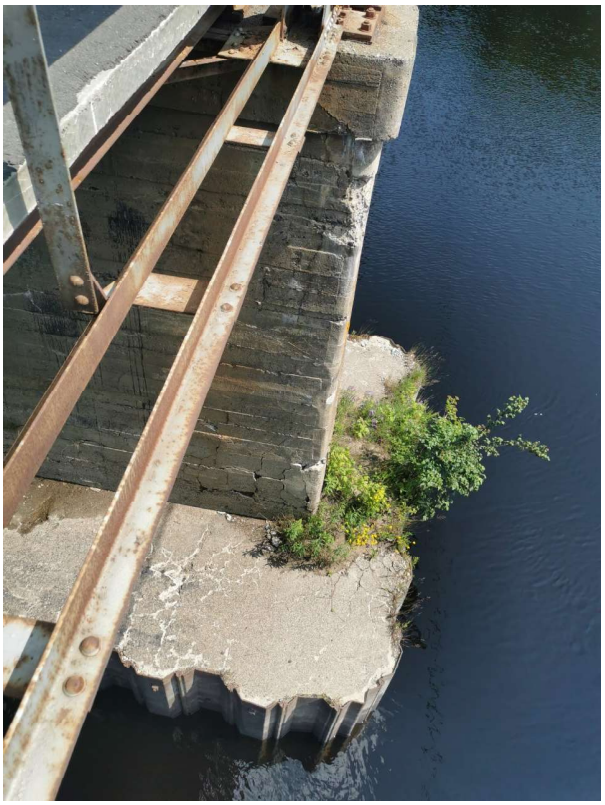
Rev2008

Recommended Work: ☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years

None

Maintenance Needs: 01. N/A

☐ Urgent ☐ 1 year ☐ 2 year



Typical Pier With Localized Spalling and Medium to Wide Cracking Throughout

Element Data

Element Group:	Piers	**Length:**	-
Element Name:	Bearings	**Width:**	-
Location:	Intermediate Piers	**Height:**	-
Material:	Other	**Count:**	4
Element Type:	Elastomeric Pads	**Total Quantity:**	4 (each)
Environment:	**Benign** / **Moderate** / **Severe**	**Inspected:**	**Yes** ☐ **No** ☐ **Limited** ☒
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all			3	1	00. None

Comments:
Light weathering of steel bearing plates. Rubber pads have light bulge when felt by hand. Undermining of the bearing plate at the west side of south pier (upstream side). This may be causing the deck elevation difference at the joint.

Rev2008

Recommended Work: ☒ Rehab ☐ Replace
☒ 1-5 years ☐ 6-10 years
Jacking and stabilizing the undermining of the bearing plate/pad.

Maintenance Needs: 01. N/A
☐ Urgent ☐ 1 year ☐ 2 year

Pier Bearings General Arrangement (South Pier)

Element Data

Element Group:	Piers	**Length:**	-
Element Name:	Bearings	**Width:**	-
Location:	Intermediate Piers	**Height:**	-
Material:	Steel	**Count:**	4
Element Type:	Plate	**Total Quantity:**	4 (each)
Environment:	**Benign** / **Moderate** / **Severe**	**Inspected:**	**Yes** ☐ **No** ☐ **Limited** ☒
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m² / m / each / % / all			4		00. None

Comments:
Light to medium corrosion throughout, severe localized corrosion and minor rust jacking.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None.	

Typical Pier Bearing (North Pier)

Element Data

Element Group:	Trusses/Arches	**Length:**	111.20 m
Element Name:	Bottom Chord	**Width:**	0.10 m
Location:		**Height:**	0.15 m
Material:	Steel	**Count:**	2
Element Type:	T-type	**Total Quantity:**	111.2 sq. m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:	Painted		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all			89.0	22.2	01

Comments:
Moderate to severe corrosion with flaking, gravel and debris noted on bottom chords, localized rust jacking at gusset plates and angle connection. Severely corroded rivets/bolts.

Rev2008

Recommended Work:	**Maintenance Needs:** 02. Bridge Cleaning
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☒ 1 year ☐ 2 year
None	Clean gravel and debris from bottom chord members/plating.

Typical Bottom Chord - Double angles

Element Data

Element Group:	Trusses/Arches	**Length:**	128.7 m
Element Name:	Top Chord	**Width:**	0.36 m
Location:		**Height:**	0.20 m
Material:	Steel	**Count:**	2
Element Type:	Box/Trapezoidal	**Total Quantity:**	285.7 sq.m
Environment:	**Benign** / **Moderate** / **Severe**	**Inspected:**	**Yes** ☒ **No** ☐ **Limited** ☒
Protection System:	Painted		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / **m** / **each** / **%** / **all**			284.0	1.7	00. None

Comments:

Light to medium corrosion throughout. Light corrosion on rivets. Small localized areas of impact damage from oversized vehicles were noted in the structure. Some instances of damage to the inside surface of the top chord appeared new and some damages appeared to have been previously coated over top of.

Rev2008

Recommended Work: ☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years

None

Maintenance Needs: 01. N/A

☐ Urgent ☐ 1 year ☐ 2 year

Top Chord - Built up Box Section. Various locations with impact damage to the interior edges.

Element Data

Element Group:	Trusses/Arches	**Length:**	varies
Element Name:	Vertical/Diagonals	**Width:**	varies
Location:		**Height:**	varies
Material:	Steel	**Count:**	
Element Type:	T-type	**Total Quantity:**	392.6 sq.m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:	Hot dip galvanizing		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all			352.6	40	00. None

Comments:

Light to moderate corrosion with flaking and isolated rust jacking, 1st and 2nd diagonal of South span on East truss have minor localized bends, 1st diagonal from the North end of the west Abutment has local distortion. Uncertain if this was from an impact load or an overloading scenario. 3rd vertical from South on West truss in the 2nd span has localized impact damage at guiderail.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☒ Rehab ☐ Replace ☒ 1-5 years ☐ 6-10 years Monitor with yearly inspections	☐ Urgent ☐ 1 year ☐ 2 year

Localized distortion of diagonal (inner) on the West Truss at North Abutment

Element Data

Element Group:	Trusses/Arches	**Length:**	-
Element Name:	Connections	**Width:**	-
Location:		**Height:**	-
Material:		**Count:**	72
Element Type:		**Total Quantity:**	72 (each)
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all			58	14	02. Excessive Deform

Comments:
Light to medium corrosion with flaking and rust jacking, severe corrosion with pitting observed at the SW and SE bearing, gravel/ debris noted on connections and on bottom chord, perforations at North and South pier, East and West truss, moderate to severely corroded rivets at all connection locations.

Rev2008

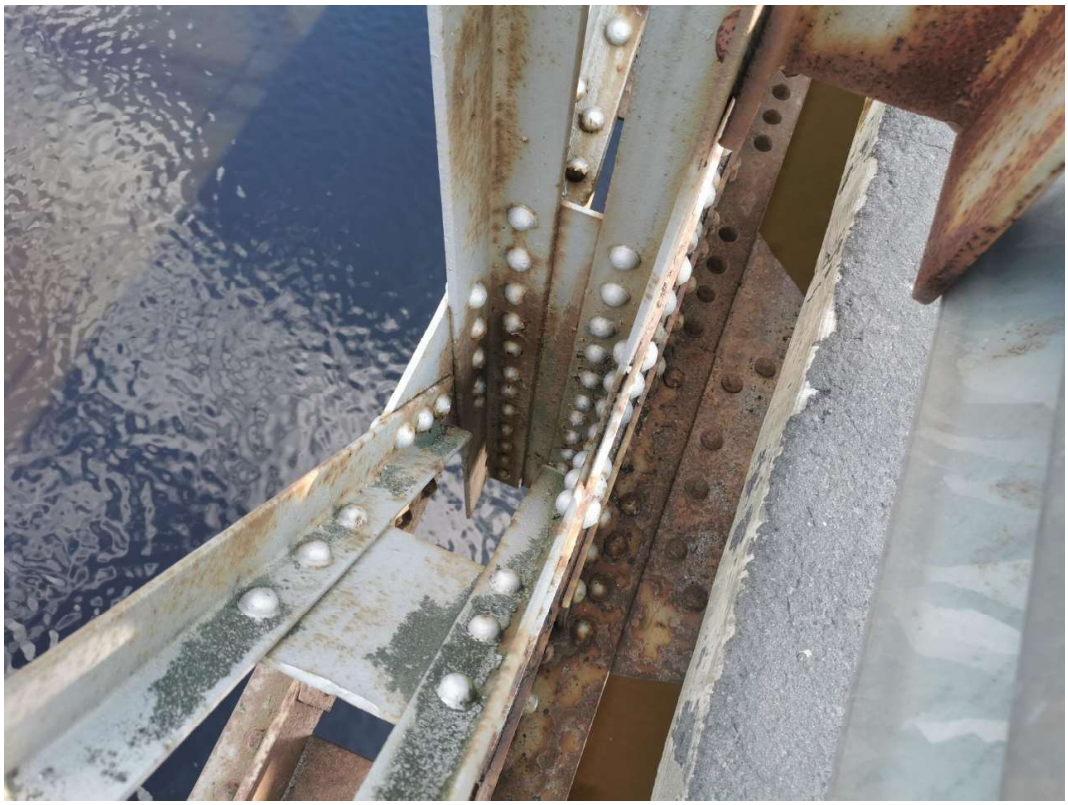
Recommended Work: ☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years

None

Maintenance Needs: 02. Bridge Cleaning

☐ Urgent ☒ 1 year ☐ 2 year

Cleaning of gravel and debris from connections



Moderate to Severe Corrosion of Rivets and Gusset plates.

Element Data

Element Group:	Bracing	**Length:**	-
Element Name:	Bracing	**Width:**	-
Location:		**Height:**	-
Material:		**Count:**	33
Element Type:		**Total Quantity:**	33 (each)
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☐**
Protection System:	Hot dip galvanizing		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all			31	2	00. None

Comments:
No significant change to the top chord bracing at the South end of North span (localized bends, flaking of coating with light corrosion evident). Two rivets loose in top chord of connection.

Rev2008

Recommended Work:	☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	**Maintenance Needs:**	01. N/A ☐ Urgent ☐ 1 year ☐ 2 year
None			

Warping of Vertical near connection to 'K' bracing

Element Data

Element Group:	Embankments and Streams	**Length:**	-
Element Name:	Slope Proctection	**Width:**	-
Location:	Northwest Quadrant	**Height:**	-
Material:	Blasted Rock	**Count:**	1
Element Type:		**Total Quantity:**	1 (each)
Environment:	**Benign** / Moderate / Severe	**Inspected:**	Yes ☐ No ☐ Limited ☐
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / **each** / % / all		1			00. None

Comments:
Rock protection in NW quadrant is in good condition with no evidence of erosion.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None.	

Rock Protection on NW Embankment

Element Data

Element Group:	Joints	**Length:**	-
Element Name:	Armouring/Retaining Devices	**Width:**	4.03 m
Location:	Ends of Deck Spans	**Height:**	-
Material:	Steel	**Count:**	4
Element Type:		**Total Quantity:**	16.1 m
Environment:	Benign / Moderate / **Severe**	**Inspected:**	Yes ☒ No ☐ Limited ☒
Protection System:	Hot dip galvanizing		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / **m** / **each** / **%** / **all**		12.0	4.1		00. None

Comments:
Light to moderate wear with localized light corrosion. The second armouring plate from the South pier has lifted slightly, allowing gravel and debris underneath the plate.

Rev2008

Recommended Work:	**Maintenance Needs:** 02. Bridge Cleaning
☒ Rehab ☐ Replace ☒ 1-5 years ☐ 6-10 years	☐ Urgent ☒ 1 year ☐ 2 year
Rehab/reconnect armouring steel	Cleaning of gravel debris from connections.

Lifted Armouring Plate at Centerline, Rotated at West side of Bridge

Element Data

Element Group:	Joints	**Length:**	0.30 m
Element Name:	Concrete end dams	**Width:**	6.40 m
Location:	Abutments	**Height:**	-
Material:	Concrete	**Count:**	2
Element Type:		**Total Quantity:**	3.8 sq.m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☒**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		3.8			00. None

Comments:
Light abrasions and wear, asphalt patching over South end dam.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None	

Typical Concrete End Dam

Element Data

Element Group:	Joints	**Length:**	-
Element Name:	Seals/Sealant	**Width:**	-
Location:		**Height:**	-
Material:	Other	**Count:**	6
Element Type:	Strip Seal	**Total Quantity:**	6 (each)
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:			

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all				6	07

Comments:
Light to severe cracking and separation of seals at bridge deck joints, light to wide cracking with patching observed at the deck joints. Sections of seals missing on mid-span.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☒ Replace ☒ 1-5 years ☐ 6-10 years Replace bridge deck joints/seals.	☐ Urgent ☐ 1 year ☐ 2 year

Rev2008

Joint Seal Severely Deteriorated with Sections Missing

Element Data

Element Group:	Abutments	**Length:**	-
Element Name:	Abutment Walls	**Width:**	7.47 m
Location:	North and South Ends of Bridge	**Height:**	4.80 m
Material:	Concrete	**Count:**	2
Element Type:	Conventional Closed	**Total Quantity:**	71.7 sq. m
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:			**Perform. Deficiencies**

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***
	(m²) / m / each / % / all				71.7

Comments:
Stained narrow to wide map cracking with efflorescence, delamination, light to severe scaling, gravel/debris buildup and spalls.

Recommended Work:	**Maintenance Needs:** 01. N/A
☒ Rehab ☐ Replace ☒ 1-5 years ☐ 6-10 years Partial depth concrete repairs to abutment walls	☐ Urgent ☐ 1 year ☐ 2 year

Severe Spalling, Delamination and Efflorescence Throughout Abutment Walls

Element Data

Element Group:	Abutments	**Length:**	0.30 m
Element Name:	Ballast Walls	**Width:**	7.70 m
Location:	North and South Ends of Bridge	**Height:**	0.46 m
Material:	Concrete	**Count:**	2
Element Type:		**Total Quantity:**	7.1 sq. m
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☒**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	(m²) / m / each / % / all		7.1			00. None

Comments:
Light pop-outs, moderate spall Northwest Quadrant.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None	

Element Data

Element Group:	Abutments	**Length:**	-
Element Name:	Wingwalls	**Width:**	4.90 m
Location:	4 Corners of the Abutments	**Height:**	4.40 m
Material:	Concrete	**Count:**	4
Element Type:	Mass Concrete	**Total Quantity:**	86.2 sq.m
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:			**Perform. Deficiencies**

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***
	(m²) / m / each / % / all				86.2

00. None

Comments:
Stained narrow to wide map cracking with efflorescence, delamination, light to severe scaling and spalls.

Rev2008

Recommended Work: ☒ Rehab ☐ Replace
☒ 1-5 years ☐ 6-10 years
Partial depth concrete repairs to abutment wingwalls.

Rev2008

Maintenance Needs: 01. N/A
☐ Urgent ☐ 1 year ☐ 2 year

Delaminations and Efflorescence Throughout Wingwalls

Element Data

Element Group:	Abutments	**Length:**	-
Element Name:	Bearings	**Width:**	-
Location:	North and South Ends of Bridge	**Height:**	-
Material:	Other	**Count:**	4
Element Type:	Elastomeric Pads	**Total Quantity:**	4 (each)
Environment:	**Benign / (Moderate) / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m /(each) / % / all		4			00. None

Comments:
Gravel and dirt debris buildup at bearings/pads. Bearing pads are generally in good condition with light bulging and shear deformation

Rev2008

Recommended Work: ☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years

None

Maintenance Needs: 02. Bridge Cleaning

☐ Urgent ☒ 1 year ☐ 2 year

Clean bearing seats free of gravel/debris

Element Data

Element Group:	Approaches	**Length:**	6.0 m
Element Name:	Barriers	**Width:**	-
Location:	East and West Edges of Approaches	**Height:**	-
Material:	Steel	**Count:**	4
Element Type:	Steel Flex Beam on Wood Posts	**Total Quantity:**	24.0 m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☐**
Protection System:			

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all			6.0	18.0	01.

Comments:
Vehicular damage to barrier at SW quadrant, missing guiderail bolts, moderate to severe decay of wood posts, wide splits and checks with severe end decay, buried end treatments at approach guiderails on the south approach.

Recommended Work: ☒ Rehab ☐ Replace
☒ 1-5 years ☐ 6-10 years
Replace guiderails and upgrade end treatments.

Maintenance Needs: 17. Scaling
☐ Urgent ☒ 1 year ☐ 2 year
Replace missing and/or tighten loose bolts in approach guiderails, replace decayed posts.

Wooden Posts with Moderate to Severe End Decay.

Element Data

Element Group:	Approaches	**Length:**	6.0 m
Element Name:	Wearing Surface	**Width:**	3.70 m
Location:	North and South Approaches	**Height:**	-
Material:	Surface Treatment	**Count:**	2
Element Type:		**Total Quantity:**	44.4 sq.m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☐**
Protection System:			

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all			34	10.4	08, 09

Comments:
Medium to severe raveling at centerline, medium wheel rutting, light to moderate potholes with patching noted throughout the South approach.

Rev2008

Recommended Work: ☐ Rehab ☒ Replace ☒ 1-5 years ☐ 6-10 years	**Maintenance Needs:** 12. Bridge Surface Repair ☐ Urgent ☒ 1 year ☐ 2 year
Regrade South approach and replace wearing surface	Surface repairs and patching to smooth out approaches. (South Approach worse)

Rev2008

Patches and Potholes in South Approach

Element Data

Element Group:	Barriers	**Length:**	0.09 m
Element Name:	Posts	**Width:**	0.09 m
Location:	East and West Railing System	**Height:**	1.60 m
Material:	Steel	**Count:**	46
Element Type:		**Total Quantity:**	46 (each)
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☐**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		43	2	1	00. None

Comments:
Light corrosion of steel posts, localized impact damage of vertical post on West truss of center span.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None	

Barrier System on Bridge - General Arrangement

Element Data

Element Group:	Barriers	**Length:**	111.2 m
Element Name:	Railing Systems	**Width:**	-
Location:	East and West Edges of Bridge	**Height:**	-
Material:	Steel	**Count:**	2
Element Type:	Steel Flex Beam on Steel Posts	**Total Quantity:**	222.4 m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☐**
Protection System:	Hot dip galvanizing		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		202.2	20.2		00. None

Comments:
Localized medium impact damage to the railing system, light abrasions and scrapes, light corrosion, loose bolts/nuts.

Rev2008

Recommended Work:	**Maintenance Needs:** 07. Structural Steel Repair
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☒ 1 year ☐ 2 year
None	Tighten loose bolts.

Barrier System General Arrangement

Element Data

Element Group:	Barriers	**Length:**	111.2 m
Element Name:	Hand Railings	**Width:**	-
Location:	East and West Edges of Bridge	**Height:**	-
Material:	Steel	**Count:**	2
Element Type:	Steel Railing	**Total Quantity:**	222.4 m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☐**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		211.8	10.6		00. None

Comments:
Localized medium impact damage with bent retaining plate in the Southwest quadrant of South span, light corrosion throughout noted.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None.	

Hand railing with breakdown of protective coating

Element Data

Element Group:	Coatings	**Length:**	varies
Element Name:	Railing Systems/Hand Railings	**Width:**	varies
Location:	Rail and Posts	**Height:**	varies
Material:		**Count:**	1
Element Type:		**Total Quantity:**	250.8 sq.m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☐**
Protection System:	Hot dip galvanizing		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		204.0	25.0	20.8	00. None

Comments:
Light to complete breakdown of protective coating on railing posts.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None	

Breakdown of Coating throughout railing/posts.

Element Data

Element Group:	Coatings	**Length:**	varies
Element Name:	Structural Steel	**Width:**	varies
Location:	Trusses, Diagonals, Bracing, etc.	**Height:**	varies
Material:		**Count:**	1
Element Type:		**Total Quantity:**	1526.0 sq. m
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☒ No ☐ Limited ☒**
Protection System:	Hot dip galvanizing		

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		305.0	916.0	305.0	00. None

Comments:
Localized breakdown and loss of protective coating throughout

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☒ Rehab ☐ Replace ☐ 1-5 years ☒ 6-10 years Re-coat structural steel	☐ Urgent ☐ 1 year ☐ 2 year

Typical Protective Coating Condition

Element Data

Element Group:	Accessories	**Length:**	-
Element Name:	Signs	**Width:**	-
Location:	Ends of Bridge	**Height:**	-
Material:	Steel	**Count:**	8
Element Type:		**Total Quantity:**	8 (each)
Environment:	Benign / Moderate / **Severe**	**Inspected:**	Yes ☐ No ☐ Limited ☐
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / **each** / % / all		6		4	08

Comments:
Load posting signs at both approaches, 4 hazard markers at bridge corners were missing.

Rev2008

Recommended Work: ☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years

None

Maintenance Needs: 18. Other

☐ Urgent ☒ 1 year ☐ 2 year

Install hazard markers at corners of the bridge & single lane bridge markers at South approach.

Signs at North Approach

Element Data

Element Group:	Foundations	**Length:**	
Element Name:	Foundation (below ground level)	**Width:**	
Location:		**Height:**	
Material:		**Count:**	
Element Type:		**Total Quantity:**	N/A
Environment:	**Benign / Moderate / Severe**	**Inspected:**	**Yes ☐ No ☐ Limited ☒**
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all					00. None

Comments:

Rev2008

Recommended Work: ☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	**Maintenance Needs:** 01. N/A ☐ Urgent ☐ 1 year ☐ 2 year

Element Data

Element Group:	Embankments and Streams	**Length:**	-
Element Name:	Embankments	**Width:**	-
Location:	4 Corners of the Bridge	**Height:**	-
Material:	Vegetation	**Count:**	4
Element Type:		**Total Quantity:**	4 (each)
Environment:	**Benign** / **Moderate** / **Severe**	**Inspected:**	**Yes** ☒ **No** ☐ **Limited** ☐
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		3	1		00. None

Comments:
Vegetated embankments were generally in good condition. Vegetation is overgrown on Northeast quadrant. Northwest embankment has rock protection. Moderate scour noted to the northeast abutment embankment at the foundation level.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None.	

Element Data

Element Group:	Embankments and Streams	**Length:**	-
Element Name:	Streams and Waterways	**Width:**	-
Location:		**Height:**	-
Material:		**Count:**	1
Element Type:		**Total Quantity:**	1 (all)
Environment:	**Benign** / **Moderate** / **Severe**	**Inspected:**	**Yes** ☒ **No** ☐ **Limited** ☐
Protection System:			

Rev2008

Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	**Perform. Deficiencies**
	m^2 / m / each / % / all		1			00. None

Comments:
Waterway is generally unobstructed with no evidence of scour.

Rev2008

Recommended Work:	**Maintenance Needs:** 01. N/A
☐ Rehab ☐ Replace ☐ 1-5 years ☐ 6-10 years	☐ Urgent ☐ 1 year ☐ 2 year
None.	

Municipal Structure Inspection Form

MTO Site Number: 38S-234

Repair and Rehabilitation Required:		Priority				Estimated **Construction** Cost
Element	Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	
Deck	Repairs to wearing surface across structure			X		$5,000
Bearings	Repair bearing surface (SW corner of center span			X		$75,000
Approaches	Replace South wearing surface, replace guiderail		X			$45,000
Trusses	Clean bearings, bottom chord and connections			X		Maintenance
Joints	Replace bridge deck seals/joints		X			$40,000
Abutments/Piers	Partial depth concrete repairs		X			$1,200,000
Beams/MLE	Reinforcing at section loss to webs			X		$40,000
Steel Elements	Sand blasting, re-coat and steel repairs/upgrades		X			$3,575,000
					Total Cost	$4,980,000

Associated Work:	Comments	Estimated Cost
Approaches:		
Detours:	Signage and Maintenance	$10,000
Traffic Control:	By contractor (as required)	
Utilities:		
Right of Way:		
Environmental Study:	Environmental Study/Assessment	$40,000
Other:	Eng. Design and Supervision (15%)	$735,000
Contingencies:	20% Allowance	$980,000
	Total Cost	$1,765,000

Justification:
General maintenance repairs to maintain service life of structure. Partial depth concrete removal and repairs to abutment walls and wingwalls is required if long term rehabilitation is the preferred option. The concrete repairs should be completed within 5 years. Re-coating of the steel elements and steel upgrades/ repairs to corroded areas is expected and should be phased as part of a large scale rehabilitation project. South approach wearing surface and guiderails should be replaced and hazard markers sign installed. Bridge, bearings and all truss elements should be cleared of all gravel/debris annually.

ADDITIONAL PHOTOS

Looking North Across Structure

Looking South Across Structure

West Elevation

East Elevation

Impact damage to inner surface of the top chord (~3.5m above bridge deck)

Severe spalling, delamination and map cracking with efflorescence (north abutment worse)