Ontario Structure Inspection Manual (OSIM) Bridge Inspection Report

Township of Stone Mills

Prepared by: Jewell Engineering

For: Cataraqui Conservation

Dated October 22, 2020



JEWELL ENGINEERING

October 22, 2020

BELLEVILLE (HEAD OFFICE) 1—71 Millenium Pkwy. Belleville ON K8N 4Z5 Tel: 613-969-1111 info@jewelleng.ca

TOLL FREE 1-800-966-4338

KINGSTON 208—4 Cataraqui St. Kingston ON K7K 1Z7 Tel: 613-389-7250 kingston@jewelleng.ca

MISSISSAUGA 200A—2155 Leanne Blvd. Mississauga ON L5K 2K8 Tel: 905-855-1592 mississauga@jewelleng.ca

www.jewelleng.ca

Cataraqui Region Conservation Authority 1641 Perth Road P.O. Box 160 Glenburnie, ON K0H 1SO

Attn: Steve Knapton

Supervisor, Operations & Maintenance

RE: Cataraqui Region Conservation Authority 2020 OSIM Bridge Inspection Submission

Our File No. 200-9678

Dear Sir:

Jewell Engineering Inc. is pleased to provide you with our completed OSIM Bridge Inspection Reports of the Conservation Authority's eleven (11) structures within the Township of Stone Mills.

Ten (10) structures were inspected on September 24th 2020 and one (1) structure had been previously inspected under the County of Lennox and Addington's inspection cycle.

The Cataraqui Trail is owned and maintained by the Cataraqui Region Conservation Authority. The trail was originally owned by the Canadian National Railway and operated as a railbed until being donated to the Conservation Authority in 1997. The majority of structures are holdovers from the railway and are therefore over engineered for pedestrian use.

The CNR Viaduct (CRCA–SM8), located in Yarker, consists of the original railway bridge and a wearing surface and railing system modified for pedestrian use. The creosoted timber railway ties that make up the deck have started to rot. As the railway ties likely predate the transfer of ownership, they would be at least 23 years old. The wearing surface also exhibits sections of rot and decay. It has been recommended that a timber condition assessment be completed on the railway ties. The steel superstructure should be reviewed during bridge deck replacement for enhanced access. The concrete substructure has been recommended for refacing but could be forgone as repairs would be primarily superficial.

(Cont....)





The Newburgh Bridge (CRCA-SM4) and the Camden East Bridge (CRCA-SM5) both exhibit rot in the railway ties for similar reasons to the CNR viaduct mentioned above. The steel elements in each bridge appear to remain in good condition and should not require any foreseeable maintenance. Both structures require railings as they have at least a 2.5 meter vertical drop. In the case of the Newburgh Bridge, there is a 4m drop and a gap between the edge of the deck and the exterior girders.

The Harrowsmith East Culvert (CRCA-SM11) exhibits disintegration at both ends from run off. Repair of the culvert is recommended within the next 10 years as the pattern of disintegration is likely to continue.

Each attached report includes colour photographs as per Provincial requirements for bridge inspections. All bridges have been reported on using traditional OSIM reports.

We have provided an electronic copy of all inspection reports and photos for your use on the attached USB key.

Please note that the estimated costing for recommended capital work is for construction only and other costs related to the following may be required for the completion of a project: additional investigations, approvals, engineering, administration and taxes. Prior to the completion of budgeting for a proposed project, or the completion of funding applications, the Municipality is advised to seek advice from an engineering firm in regards to estimated project costs.

The remaining structures are generally in good condition with minor maintenance needs.

If you have any questions or concerns, please contact the writer.

Sincerely,

Engineer's Stamp

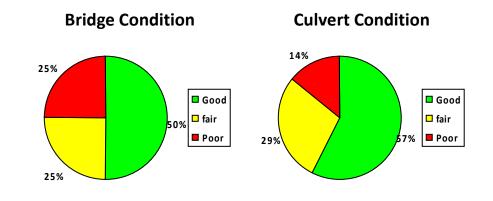
Chris Bent, P.Eng. Jewell Engineering Inc. Belleville Office

CB/jl

2020 OSIM Inspections

List 1 - Summary Listing of All Structures

	Asset I	Health Summary	,
		Bridges	
Po	oor	Fair	Good
BCI<50	50 <bci<60< td=""><td>60<bci<70< td=""><td>BCI<70</td></bci<70<></td></bci<60<>	60 <bci<70< td=""><td>BCI<70</td></bci<70<>	BCI<70
0	1	1	2
		Culverts	
Po	oor	Fair	Good
BCI<50	50 <bci<60< td=""><td>60<bci<70< td=""><td>BCI<70</td></bci<70<></td></bci<60<>	60 <bci<70< td=""><td>BCI<70</td></bci<70<>	BCI<70
1	0	2	4



Structure Number	Structure Name	Road Name	Struct. Type	Deck Area (sq.m)	Estimated Replacement Cost (\$2020)	BCI
CRCA-SM1	Strathcona Culvert West	Cataraqui Trail	Round Culvert	30.1	\$390,000.00	65.73
CRCA-SM2	Strathcona Culvert East	Cataraqui Trail	Arch Culvert	42.9	\$560,000.00	70.25
CRCA-SM3	Academy Street Entrance Culvert	Cataraqui Trail	Round Culvert	14	\$80,000.00	75
CRCA-SM4	Newburgh Bridge	Cataraqui Trail	Half-through Beams of Gi	56	\$600,000.00	68.07
CRCA-SM5	Camden East Bridge	Cataraqui Trail	I-Beams or Girders	30.8	\$400,000.00	70.52
CRCA-SM6	Camden East - Yarker West Culve	Cataraqui Trail	Rectangular Culvert	5.6	\$80,000.00	67.72
CRCA-SM7	Camden East - Yarker East Culvert	Cataraqui Trail	Rectangular Culvert	11.4	\$100,000.00	74.17
CRCA-SM8	CNR Viaduct	Cataraqui Trail	I-Beams or Girders	460	\$3,450,000.00	51.06
CRCA-SM9	Yarker East Bridge	Cataraqui Trail	I-Beams or Girders	17.2	\$100,000.00	73.32
CRCA-SM10	Harrowsmith West Culvert	Cataraqui Trail	Rectangular Culvert	24.6	\$320,000.00	71.16



2020 OSIM Inspections

List 1 - Summary Listing of All Structures

Structure				Deck Area	Estimated Replacement	
Number	Structure Name	Road Name	Struct. Type	(sq.m)	Cost (\$2020)	BCI
CRCA-SM11	Harrowsmith East Culvert	Cataraqui Trail	Rectangular Culvert	41.6	\$540,000.00	38.12



2020 OSIM Inspections

List 2 - Structures Recommended for Rehabilitation

CRCA-SM4	Newburgh Bridge			
Major Rehab	Install Railing System		\$15,000.00	Within 1 Year
Decks	Deck Top - Thin Slab	Replace deck	\$40,000.00	1-5 Years
Decks	Wearing Surface	Replace with deck (Costed under deck)		1-5 Years
		Associated Work:	\$0.00	
		Total Cost:	\$55,000.00	
CRCA-SM5	Camden East Bridge			
Minor Rehab	Install railing system		\$15,000.00	Within 1 Yea
Decks	Deck Top - Thin Slab	Replace deck	\$15,000.00	6-10 Years
Decks	Wearing Surface	Replace wearing surface (costed under deck)		6-10 Years
		Associated Work:	\$0.00	
		Total Cost:	\$30,000.00	
CRCA-SM8	CNR Viaduct			
Major Rehab				1-5 Years
Decks	Deck Top - Thin Slab	Replace Deck	\$140,000.00	1-5 Years
Barriers	Railing Systems	Replace Railing System	\$40,000.00	1-5 Years
Piers	Shafts/ Columns/ Pile Bents	Re-face Substructure	\$300,000.00	6-10 Years
		Associated Work:	\$8,000.00	
		Total Cost:	\$488,000.00	
CRCA-SM11	Harrowsmith East Culvert			
Major Rehab				6-10 Years
Culverts	Barrels	Concrete repairs to culvert ends.	\$80,000.00	6-10 Years
		Associated Work:	\$16,000.00	
		Total Cost:	\$96,000.00	



Inventory Data

Structure Name: Strathcona Culvert West

Road Name: Cataraqui Trail

Structure Location: 380m East of Findlay Street

Owner(s) CRCA

Latitude: 44.309309867 Longitude: -76.898244129 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: Round Culvert Posted Speed: 50km/h AADT: Total Deck Length: 1.22m No. of Lanes: 1 % Trucks:

Overall Str. Width: 24.7m Min. Vertical Clearance: 0

Total Deck Area: 30.1sq.m Special Routes:

Roadway Width: 2.7m Transit □ Truck □ School □ Bicycle □

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West

Span Lengths: 1.22 Fill on Structure: 3m

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:

Last Enhanced OSIM Inspection:

Enhanced Access Equipment:

Last Underwater Inspection:

Last Evaluation:

Current Load Limit

Load Limit By-Law #

By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI Equipment Used: Camera, Handtools



	Priority	Estimated Cost
Material Condition Survey		\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered De	eck	\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tota	al Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: None Timing

BCI: 65.73

Overall Comments: Date of next inspection: 2022-09-24

Culvert has minor deformation around mid-section and has light to moderate scaling along floor.



Elemen	nt Data						<u></u>
	t Group:	Culverts Barrels			Material: Corruga Element Type Pipe Ro	ited Steel und	Length: 24.7m Width: 1.22m
Location		Below trai	<u>.l</u>	ı	Environment: Benign		Height: 1.22m
	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
Sq.m	0	76.3	12.4	6	,		Total Quant. 94.7
Comme	nts:						
		osion with se	ction loss in	floor of bar	rrel. Deformation in barrel around	Limited Inspection	
mid length	n.					Performance Def:	
						Maintenance:	
Rehab F	Recommer	idations:				Timing:	
Elemen	nt Data						
Element	t Group:				Material:		Length:
Element	t Name:	Streams a	nd Water	ways	Element Type -		Width:
Location		Through c	ulvert		Environment:		Height:
	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
All	0	1	0	0	•		Total Quant. 1
Comme	nts:						
Culvert dr	y at time of i	nspection.				Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab F	Recommer	idations:				Timing:	
						-	
Elemen	nt Data						
	t Group:			Streams	Material:		Length:
Element	t Name:	Embankm	ents		Element Type -		Width:
Location		All four qu	ıadrants		Environment:		Height:
	Excellent	Good	Fair	Poor	Protect. System:		Count: 4
All	0	4	0	0	•		Total Quant. 4
Comme							
No concer	ns. Embankn	nents are hea	avily vegetat	ted.		Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab F	Recommer	idations:				Timing:	



Eleme	nt Data							
		Approach Wearing S Over culve	Surface		Material: Gravel Element Type - Environment: Severe		Length: Width: Height:	15m 2.7m
Units	Excellent	Good	Fair	Poor	Protect. System:		Count:	1
Sq.m	0	40.5	0	0	Protect. System.		Total Quant.	40.5
Comm Well gra Rehab		ndations:				Limited Inspection Performance Def: Maintenance: Timing:		



Associated Work	Comments	Estimated Cost
Approaches:		\$0.00
Detours:		\$0.00
Traffic Control:		\$0.00
Utilities:		\$0.00
Right of Way:		\$0.00
invironmental Study:		\$0.00
Other:		\$0.00
Contingencies:		\$0.00
	Assoc	iated Work Total: \$0.00

Total Estimated Cost

Total cost of Recommended Works \$0.00





South elevation



North elevation





Looking West over culvert



Looking east over culvert





Typical corrosion in culvert floor



Looking through barrel from south





Deformation of barrel at mid length



Inventory Data

Structure Name: Strathcona Culvert East

Road Name: Cataraqui Trail

Structure Location: 950m East of Finlay Street

Owner(s) CRCA

Latitude: 44.313175072 Longitude: -76.893433788 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: Arch Culvert Posted Speed: 50km/h AADT: Total Deck Length: 3m No. of Lanes: 1 % Trucks:

Overall Str. Width: 14.3m Min. Vertical Clearance:

Total Deck Area: 42.9sq.m Special Routes:

Roadway Width: 2.7m Transit □ Truck □ School □ Bicycle □

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West Span Lengths: 2.46m Fill on Structure: 1.2m

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:

Last Enhanced OSIM Inspection:

Enhanced Access Equipment:

Last Underwater Inspection:

Last Evaluation:

Current Load Limit

Load Limit By-Law #

By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI Equipment Used: Camera, Handtools



	Priority	Estimated Cost	
Material Condition Survey	,	\$0.00	
Detailed Deck condition Survey		\$0.00	
Non-Destructive Delamination Survey of Asphalt-Covered Deck	<	\$0.00	
Concrete Substructure Condition Survey		\$0.00	
Detailed Coating Conditon Survey		\$0.00	
Detailed Timber Investigation		\$0.00	
Post-Tensioned Strand Investigation		\$0.00	
Underwater Investigation		\$0.00	
Fatigue Investigation		\$0.00	
Seismic Investigation		\$0.00	
Structure Evaluation		\$0.00	
Monitoring		\$0.00	
Monitoring of Deformations, Settlements and Movements		\$0.00	
Monitoring Crack Widths		\$0.00	
Investigation Notes:	Tota	al Cost: \$0.00	

Overall Structure Notes

Recommended Work on Structure: None Timing

BCI: 70.25

Overall Comments: Date of next inspection: 2022-09-24

Structure has some cracking with efflorescence and delamination in walls. Overall structure remains in servicable condition.



Elemen	t Data						
Element	t Group: t Name:	Inlet Comp	•		Material: Cast-ir Element Type -	n-place Concrete	Length: 3.2m Width: 0.5m
Location		North end		г	Environment: Moder	rate	Height: 2.23m
	Excellent		Fair	Poor	Protect. System:		Count: 2 Total Quant. 7.14
Sq.m	0	7.14	0	0	1		Total Quant. 7.14
Comme							
Hariline cr	racks with eff	lorescence, L	ight scaling.			Limited Inspection	
						Performance Def:	
Pohah F	Recommen	adations:				Maintenance:	
Nellau I	tecommen	uations.				Timing:	
Elemen	t Data						
	t Group:	Culverts			Material: Cast-ir	n-place Concrete	Length: 3.2m
		Outlet Cor	mponents	;	Element Type -	i-place concrete	Width: 0.5m
Location		South end	•				Height: 2.23m
	Excellent	Good	Fair	Poor	Environment: Moder	rate	Count: 2
Sq.m	0	7.14	0	0	Protect. System:		Total Quant. 7.14
Comme	nts.						
	racks with eff	lorescence, I	Light scaling			Limited Inspection	П
						Performance Def:	
						Maintenance:	
Rehab F	Recommen	idations:				Timing:	
Elemen	t Data						
Element	t Group:	Culverts				n-place Concrete	Length: 14.3m
Element	t Name:	Barrels			Element Type Arch		Width: 2.46m
Location	_	Below trai		т	Environment: Benign	1	Height: 2.2m
	Excellent	Good	Fair	Poor	Protect. System:		Count: 1 Total Quant. 98
Sq.m	0	85.5	10	2.5	1		Total Qualit. 30
Comme							
					medium cracks with efflorescence at base of wall.	Limited Inspection	
			• • •	,		Performance Def:	
Dohah E						Maintenance:	
Kenab r	Recommen	dations.				Timing:	



	•						
Elemer	nt Data						
Elemen	t Group:	Embankm	ents and	Streams	Material:		Length:
Elemen	t Name:	Streams a	nd Water	ways	Element Type -		Width:
Locatio	n:	Through culvert			Environment:		Height:
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
All	0	1	0	0	Trotect. System.		Total Quant. 1
Comme	ents:						
Dry at tim	ne of inspection	on. No conce	erns.			Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab I	Recommer	ndations:				Timing:	
Elemer	nt Data						
Elemen	t Group:	Embankm	ents and	Streams	Material:		Length:
Elemen	t Name:	Embankm	ients		Element Type -		Width:
Locatio	n:	All four qu	uadrants		Environment:		Height:
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 4
All	0	3	1	0	Trotect. System.		Total Quant. 4
Comme	ents:						
		west quadra	nt. Timber r	etaiing wall	been erected but erosion	Limited Inspection	
continues	below.					Performance Def:	
						Maintenance:	
Rehab I	Recommer	ndations:				Timing:	
Elemer	nt Data						
Elemen	t Group:	Approach	es		Material: Gravel		Length: 20m
Elemen	t Name:	Wearing S	Surface		Element Type -		Width: 2.7m
Locatio	n:	Over culve	ert		Environment: Severe		Height: 0m
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
Sq.m	0	54	0	0	riolect. System.		Total Quant. 54
Comme	ents:						
	ed. Good cor	dition.				Limited Inspection	
						•	
						Performance Def: Maintenance:	
Rehab I	Recommer	ndations:				Timing:	
						· · · · · · · · · · · · · · · · · · ·	



Associated Work	Comments	Estimated Cost
Approaches:		\$0.00
Detours:		\$0.00
Traffic Control:		\$0.00
Utilities:		\$0.00
Right of Way:		\$0.00
invironmental Study:		\$0.00
Other:		\$0.00
Contingencies:		\$0.00
	Assoc	iated Work Total: \$0.00

Total Estimated Cost

Total cost of Recommended Works \$0.00





South elevation



North elevation





Looking east over culvert



Looking west over culvert





East wall (typical)



West wall (typical)





Cracking with efflorescence in west wall



Spalling and delamination in east wall





Cracking with efflorescence in west wall



Typical soffit detail





Southwest outlet wall (typical)



Inventory Data

Structure Name: Academy Street Entrance Culverts

Road Name: Cataraqui Trail

Structure Location: 15m South of Academy Street

Owner(s) CRCA

Latitude: 44.322940279 Longitude: -76.882739416 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: Round Culvert Posted Speed: 50km/h AADT: Total Deck Length: 2m No. of Lanes: 1 % Trucks:

Overall Str. Width: 7m Min. Vertical Clearance:

Total Deck Area: 14sq.m Special Routes:

Roadway Width: 2.7m Transit □ Truck □ School □ Bicycle □

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 2 Direction of Structure: North-South

Span Lengths: 1m; 1m Fill on Structure: 0.3m

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:

Last Enhanced OSIM Inspection:

Enhanced Access Equipment:

Last Underwater Inspection:

Last Evaluation:

Current Load Limit

Load Limit By-Law #

By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI
Equipment Used: Camera, Handtools



	Priority	Estimated Cost
Material Condition Survey	THOTICY	\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Deck		\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tota	al Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: None Timing

BCI: 75

Overall Comments: Date of next inspection: 2022-09-24

Culverts are in good condition.



Elemen	nt Data						
Element Element	t Group: t Name:	Barrels			Material: Corruga Element Type Pipe Ro	rated Steel ound	Length: 7m Width: 1m
Location		Below trai			Environment: Benign		Height: 1m
	Excellent		Fair	Poor	Protect. System:		Count: 2
Sq.m	0	44	0	0	J		Total Quant. 44
Comme							
Culverts re	emain in goo	d condition.				Limited Inspection	
						Performance Def: Maintenance:	
Rehab F	Recommen	ndations:				Timing:	
Elemen							
	-	Embankm			Material:		Length:
Element	t Name:	Streams a	nd Water	ways	Element Type -		Width:
Location	n:	Through c	ulverts		Environment:		Height:
	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
All	0	1	0	0]		Total Quant. 1
Comme	nts:						
No concer	rns. Ditch flov	ws north to s	outh.			Limited Inspection	
1						Performance Def:	_
 						Maintenance:	
Rehab Recommendations:				Timing:			
i						-	
Elemen							
	t Group: t Name:	Embankm Embankm		Streams	Material: Gravel Element Type -		Length: Width:
Location: All four quadrants Environment: Mod				_	Environment: Modera	240	Height:
Units	Excellent	Good	Fair	Poor	Protect. System:	ate	Count: 4
All	0	4	0	0]		Total Quant. 4
Comme	nts:						
Heavily ve	egetated. No	concerns.				Limited Inspection	
i						Performance Def:	
<u> </u>						Maintenance:	
Rehab P	Recommen	ıdations:				Timing:	



Eleme	nt Data						
Element Group: Approaches Element Name: Wearing Surface Location: Over culverts Units Excellent Good Fai		Wearing S	Surface		Material: Gravel Element Type - Environment: Severe		Length: 10m Width: 2.7m Height:
		Fair	Poor	Protect. System:		Count: 1	
Sq.m	0	27	0	0	Frotect. System.		Total Quant. 27
Comm	ents:						
Well gra	ded. Good co	ndition.				Limited Inspection Performance Def:	
Rehab Recommendations:						Maintenance: Timing:	



Associated Work	Comments	Estimated Cost
Approaches:		\$0.00
Detours:		\$0.00
Traffic Control:		\$0.00
Utilities:		\$0.00
Right of Way:		\$0.00
nvironmental Study:		\$0.00
Other:		\$0.00
Contingencies:		\$0.00
	Assoc	iated Work Total: \$0.00

Total Estimated Cost

Total cost of Recommended Works \$0.00





West elevation



East elevation





Looking north over culverts



Looking through south barrel





Looking south over culverts



Looking through north barrel



Inventory Data

Structure Name: Newburgh Bridge Road Name: Cataraqui Trail

Structure Location: 210m West of East County Road 17 Entrance

Owner(s) CRCA

Latitude: 44.338106463 Longitude: -76.866823637 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: Half-through Beams of Girders Posted Speed: 50km/h AADT: Total Deck Length: 10.8m No. of Lanes: 1 % Trucks:

Overall Str. Width: 5.2m Min. Vertical Clearance: 0

Total Deck Area: 56sq.m Special Routes:

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West

Span Lengths: 9.8m Fill on Structure:

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:
Last Enhanced OSIM Inspection:
Current Load Limit
Enhanced Access Equipment:
Last Underwater Inspection:
By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI Equipment Used: Camera, Handtools



	Priority	Estimated Cost
Material Condition Survey		\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Decl	k	\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tota	al Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: Major Rehab Timing Within 1 Year

BCI: 68.07

Overall Comments: Date of next inspection: 2022-09-24

Superstructure remains in good condition. Deck will require replacement within the next 5 years.



	•						
Elemer	nt Data						
Elemen	t Group:	Decks			Material: Wood		Length: 10.8m
Elemen	t Name:	Wearing S	urface		Element Type -		Width: 3.02m
Location	ո։	Over railw	ay ties		Environment: Severe		Height:
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
Sq.m	0	27.1	5	0.5	Frotect. System.		Total Quant. 32.6
Comme	nts:						
Loose nail	s, weatherin	g and splitting	g throughou	ut. Abrasion a	at deck ends.	Limited Inspection	
						Performance Def:	
						Maintenance:	
	Recomme						Years
Replace	with deck	(Costed u	nder deck	<)		-	
Elemer	nt Data						
Elemen	t Group:	Decks			Material: Wood		Length: 10.8m
Elemen	t Name:	Deck Top -	- Thin Slat	Ö	Element Type Wood P	ʻlanks	Width: 4m
Location: Deck surface					Environment: Severe		
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
Sq.m	0	23.2	15	5	J Total System.		Total Quant. 43.2
Comme	nts:						
					on growing through checks and	Limited Inspection	✓
splits. One	e split railway	y tie at the ea	st end of de	≥ck.		Performance Def:	
						Maintenance:	
	Recomme	ndations:					Years
Replace	deck					·······o·	
Elemer	nt Data						
Elemen	t Group:	Beams			Material: Steel		Length: 10.8m
Elemen	t Name:	Girders			Element Type I-Type		Width: 0.36m
Location	ո։	North and	south ex	terior	Environment: Severe		Height: 1.25m
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 2
Sq.m	0	85.1	0	0	J Total System.		Total Quant. 85.1
Comme	nts:						
Light corr	osion. Gener	ally in good c	ondition.			Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab F	Recommei	ndations:				Timing:	
						g.	



Elemer	nt Data						
Elemen	t Group:	Beams			Material: Steel		Length: 3.4m
Elemen	t Name:	Floor Bea	ms		Element Type I-Type		Width: 0.15m
Locatio	n:	Underside	e of bridge	5	Environment: Benign		Height: 0.45m
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 4
Sq.m	0	20.4	0	0	Protect. System.		Total Quant. 20.4
Comme	ents:						
Light corr	rosion. Genera	ally in good o	condition.			Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab I	Recommer	ndations:				Timing:	
Elemer	nt Data					<u></u>	
	t Group:	Beams			Material: Steel		Length: 3.4m
	it Name:				Element Type I-Type		Width: 0.15m
Locatio		Underside	e of deck				Height: 0.45m
Units Excellent Good Fair Poor					Environment: Benign		Count: 12
Sq.m	0	12	0	0	Protect. System:		Total Quant. 12
Comme	ants.						
	remain in god	od condition				Limited Inspection	
						•	
						Performance Def:	
Rehab	Recommer	ndations:				Maintenance:	
						Timing:	
Flemer	nt Data						
	t Group:	Bracing			Material: Steel		Length:
		Bracing			Element Type Channel		Width:
Locatio		_	e of bridge	۵			Height:
Units	Excellent		Fair	Poor	Environment: Benign		Count: 3
Sq.m	0	3	0	0	Protect. System:		Total Quant. 3
Comme	ants.						
	cing remains	in good cond	dition.			Limited Inspection	
	-	-				•	
						Performance Def:	
Rehab	Recommer	ndations:				Maintenance:	
						Timing:	



John III.	spections					Site Nulliber. Ci	NCA-3IVI4
Elemer	it Data						
	t Group: t Name:	Abutment Abutment			Material: Cast-in Element Type Conver	n-place Concrete ntional Closed	Length: 7.45m
Location		East and w					Height: 4.2m
Units	Excellent		Fair	Poor	Environment: Moder	ate	Count: 2
Sq.m	0	54.1	6	2.5	Protect. System:		Total Quant. 62.6
Comme							
Light to m	noderate scali t. Light to mo	derate disinte			escence in south end of east south end. Spalling with exposed	Limited Inspection	
rebar in n	orth end of e	ast footing.				Performance Def:	
Rehab F	Recommer	ndations:				Maintenance:	
						Timing:	
Elemer	nt Data						
Elemen	t Group:	Abutment	is		Material: Cast-in	n-place Concrete	Length:
Elemen	t Name:	Ballast Wa	alls		Element Type -		Width: 7.45m
Location	n:	East and w	west		Environment: Moder	rato	Height: 0.8m
Units	Excellent	Good	Fair	Poor	Protect. System:	ate	Count: 2
Sq.m	0	9.4	2	0.5]		Total Quant. 11.9
Comme	nts:						
		floor beam c	onfiguration	n. Assumed t	to be in similar condition to	Limited Inspection	✓
abutment	waiis.					Performance Def:	
						Maintenance:	
Rehab F	Recommer	ıdations:				Timing:	
Elemer							
	t Group:				Material: Cast-in Element Type Reinfor	n-place Concrete	Length: 7.2m
	t Name:				LICINCII TYPE NEITHO	rea concrete	Width:
Location		All four qu			Environment: Moder	rate	Height: 4.2m Count: 4
Units Sam	Excellent 0	Good 35.5	Fair 15	Poor 10	Protect. System:		Total Quant. 60.5
Sq.m		33.3	10	10			
Comme		laing with o	ffloracconco	- disintagrat	ion. Northeast wingwall has a		_
	alling and cra k and has sta			, disintegrati	on. Northeast Wingwall Has a	Limited Inspection	
						Performance Def:	
Rehab F	Recommer	ndations:				Maintenance:	
						Timing:	



Eleme	nt Data						
Elemen	it Group:	Abutment	ts		Material: Steel		Length:
Elemen	it Name:	Bearings			Element Type Plate		Width:
Locatio	n:	On abutm	nent walls		Environment: Made		Height:
Units	Excellent	Good	Fair	Poor	Environment: Mode Protect. System:	erate	Count: 4
Each	0	4	0	0	Protect. System.		Total Quant. 4
Comme	ents:						
	o be in good o	condition.				Limited Inspection	
						_	
						Performance Def: Maintenance:	
Rehab	Recomme	ndations:				<pre>iviaintenance: Timing:</pre>	
						i iiiiiig.	
Elemei	nt Data						
	it Group:	Foundation	ons		Material:		Length:
				w Ground L	-1		Width:
Locatio		Below abu					Height:
Units	Excellent		Fair	Poor	Environment:		Count:
011.55	LAGGIGIT			100.	Protect. System:		Total Quant.
Cammi							
No visible	ents: e evidence of	foundation i	nstahility			1	
IVO VISIO.	evidence o.	Touridation	istability.			Limited Inspection	✓
						Performance Def:	
Rehab	Recomme	ndations:				Maintenance:	
						Timing:	
Eleme	nt Data						
			tants and	Ctrooms	Matarial		l a a ath,
	it Group: it Name:			Streams	Material: Element Type -		Length: Width:
							Height:
Locatio Units	n: Excellent	All four qu	Fair	Door	Environment:		Count: 4
All	0	4	o Pair	Poor 0	Protect. System:		Total Quant. 4
		-		U	1		
Comme						7	
Well vege	etated. No co	ncerns.				Limited Inspection	
						Performance Def:	
Dabab	D = == m m o					Maintenance:	
Kenab	Recomme	naations.				Timing:	



Eleme	nt Data						
	nt Name:	Approach Wearing S East and v	Surface		Material: Gravel Element Type -		Length: 6m Width: 2.7m Height:
Units	Excellent	Good	Fair	Poor	Environment: Severe Protect. System:		Count: 2
Sq.m	0	32.4	0	0	Protect. System.		Total Quant. 32.4
Comm	ents:						
Well gra	ded. Good coi	ndition.				Limited Inspection Performance Def: Maintenance:	
Rehab	Recomme	ndations:				Timing:	



Recommended Work by Element

Element Name Recommended work Timing Estimated Cost

Deck Top - Thin Slab Replace deck 1-5 Years \$40,000.00

Recommended General Work

Recommended Work Description Timing Estimated Cost
Major Rehab Install Railing System Within 1 Year \$15,000.00

Associated Work		
Associated Work	Comments	Estimated Cost
Approaches:		\$0.00
Detours:		\$0.00
Traffic Control:		\$0.00
Utilities:		\$0.00
Right of Way:		\$0.00
Environmental Study:		\$0.00
Other:	Mobilization, Bonding, Insurance	\$15,000.00
Contingencies:		\$10,000.00
	Associated Work Total:	\$25,000.00

Total Estimated Cost

Total cost of Recommended Works \$80,000.00



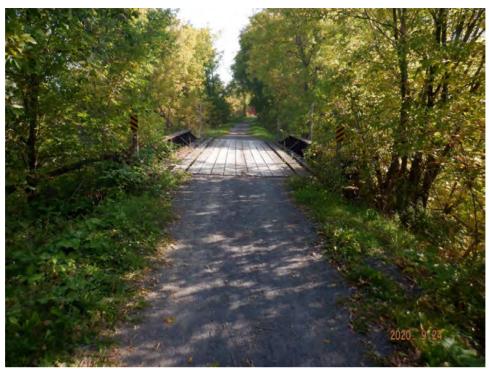


North elevation



South elevation



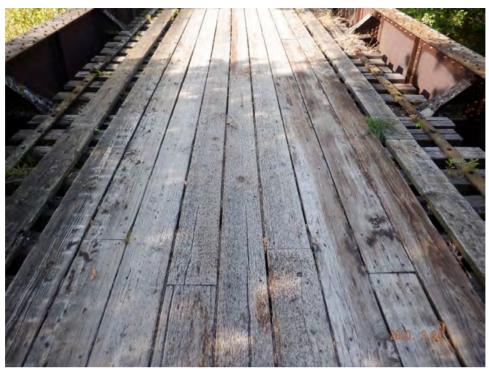


Looking east over bridge

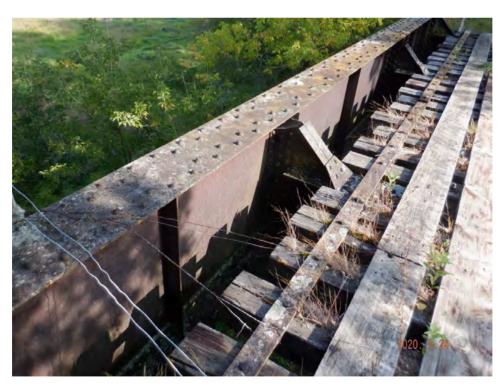


Looking west over bridge





Deck wearing surface

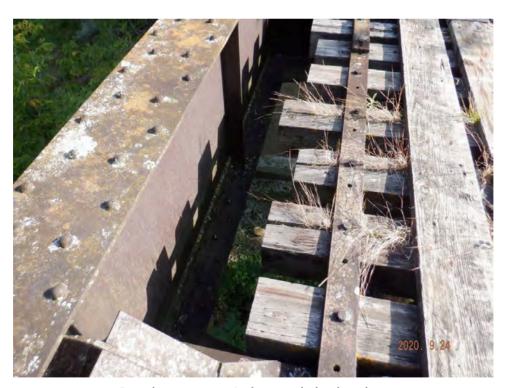


North girder detail





South girder detail



Gap between girder and deck edge





Rot and vegetation growth in railway ties



Split Railway tie in northeast





Typical soffit detail



West abutment wall





East abutment wall



Spall in northeast footing





Southeast wingwall



Disintegration in northwest abutment wall





Cracking with efflorescence in southeast abutment



Inventory Data

Structure Name: Camden East Bridge Road Name: Cataraqui Trail

Structure Location: 550m East of County Road 17

Owner(s) CRCA

Latitude: 44.340090506 Longitude: -76.857865804 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: I-Beams or Girders Posted Speed: 50km/h AADT: Total Deck Length: 7.7m No. of Lanes: 1 % Trucks:

Overall Str. Width: 4m Min. Vertical Clearance: 0

Total Deck Area: 30.8sq.m Special Routes:

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West

Span Lengths: 7 Fill on Structure: 0m

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:
Last Enhanced OSIM Inspection:
Current Load Limit
Enhanced Access Equipment:
Last Underwater Inspection:
By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI
Equipment Used: Camera, Handtools



Additional Investigations Required		
	Priority	Estimated Cost
Material Condition Survey		\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Deck		\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tota	al Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: Minor Rehab Timing Within 1 Year

BCI: 70.52

Overall Comments: Date of next inspection: 2022-09-24

Recommend installing railing system over structure. Railway ties that make up deck have started to rot and have vegetation growing from cracks and checks. Deck may require replacement within 6-10 years.



Elemen	t Data				<u></u>	
		Dooks			Matarial Wood	Longth: 7.7m
Element	t Group:		···rfaco		Material: Wood Element Type -	Length: 7.7m Width: 2.6m
		Wearing S				
Location		Covering of		_	Environment: Severe	Height: Count: 1
	Excellent	Good	Fair	Poor	Protect. System:	Count: 1 Total Quant. 20
Sq.m	0	17	3	0		Total Qualit. 20
Comme	nts:					
Wearing s	urface has lig	ght to moder	ate checks a	nd splits. So	me loose boards.	Limited Inspection
						Performance Def:
						Maintenance:
Rehab P	Recommer	ndations:				Timing: 6-10 Years
Replace	wearing s	urface (co	sted unde	r deck)		
Elemen	t Data					
		Decks			Material: Wood	Length: 7.7m
Element	•	Deck Top	- Thin Slak)	Element Type Wood P	
Location		•				Height:
Location: Railway Tie Deck Units Excellent Good Fair Poor			Poor	Environment: Severe Count: 1		
Sq.m	0	17.8	8	5	Protect. System:	Total Quant. 30.8
	·					
Comme		ake and enlite	and railway	tion Vegets	ation growing from cracks	
_	ot within the		dilu ranvvuy	lles. Vegett	Ition growing nom cracks	Limited Inspection
						Performance Def:
Pohah F	Recommer	adations				Maintenance:
Replace		luations.				Timing: 6-10 Years
Replace	UECK					
Elemen						
	t Group:				Material: Steel	Length: 7.7m
Element	t Name:	Girders			Element Type I-Type	Width: 0.19m
Location		Underside	of bridge		Environment: Benign	Height: 0.61m
	Excellent	Good	Fair	Poor	Protect. System:	Count: 6
Sq.m	0	91.5	0	0	,	Total Quant. 91.5
Comme	nts:					
Light corro	osion. Genera	ally in good c	ondition.			Limited Inspection
						Performance Def:
						Maintenance:
Rehab P	Recommer	ndations:				Timing:
						riiiiiig.
i						



•••••	Spections					Site Number. C	
Elemer	nt Data						
Elemen	t Group:	Abutment	:S		Material: Cast-i	n-place Concrete	Length:
Elemen	t Name:	Abutment	Walls		Element Type Conve	entional Closed	Width: 3.5m
Location	n:	East and v	vest		Environment: Sever	^	Height: 2.3m
Units	Excellent	Good	Fair	Poor	Protect. System:	e	Count: 2
Sq.m	0	13.6	2	0.5	Trottett. System.		Total Quant. 16.1
Comme	ents:						
		ase of wall. L	ight AAR thr	oughout. Lig	ght to moderate delamination	Limited Inspection	
and disint	tegration.					Performance Def:	
						Maintenance:	
Rehab F	Recommer	ndations:				Timing:	
						o .	
Elemer	nt Data						
	t Group:					n-place Concrete	Length:
Elemen	t Name:	Ballast Wa	alls		Element Type -		Width: 3.5m
Location	n:	East and v	vest		Environment: Mode	rate	Height: 0.8m
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 2
Sq.m	0	4.35	1	0.25	, , , , , , , , , , , , , , , , , , , ,		Total Quant. 5.6
Comme	ents:						
Condition	assumed ba	sed on abutn	nent wall co	ndition.		Limited Inspection	✓
						Performance Def:	
						Maintenance:	
Rehab F	Recommer	ndations:				Timing:	
Elemer	nt Data						
	t Group:					n-place Concrete	Length: 3.2m
Elemen	t Name:	Wingwalls	5		Element Type Reinf	orcea Concrete	Width:
Location		All four qu			Environment: Mode	rate	Height: 2.1m
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 4
Sq.m	0	8.5	3	1.5			Total Quant. 13.4
Comme							
Wide crac	cks in southw	est wingwall	. Light spallii	ng in northw	rest. Light scaling throughout.	Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab I	Recommer	ndations:				Timing:	



OSHVI III	Spections	,				Site Number. C	NC/ C SIVIS
Eleme	nt Data						
Elemen	t Group:	Retaining	walls			-in-place Concrete	Length: 3.5m
Elemen	t Name:	Walls			Element Type Rein	forced Concrete	Width:
Locatio	1	Northwes	t		Environment: Beni	gn	Height: 1.2m
Units	Excellent		Fair	Poor	Protect. System:	6.	Count: 1
Sq.m	0	2.95	1	0.25			Total Quant. 4.2
Comme							
Light spal	ling. Light to	moderate sc	aling throug	hout.		Limited Inspection	
						Performance Def:	
Rehah	Recommei	ndations:				Maintenance:	
Kellab	Recomme	iuations.				Timing:	
Elomo	nt Data						
	t Group:	Foundatio	nnc.		Material:		Length:
				v Ground L			Width:
Locatio		Below abu					Height:
Units	Excellent	Good	Fair	Poor	Environment:		Count:
					Protect. System:		Total Quant.
Comme	ents:						
No visible	e evidence of	foundation in	nstability at	time of inspe	ection.	Limited Inspection	✓
						Performance Def:	
						Maintenance:	
Rehab	Recomme	ndations:				Timing:	
	nt Data						
	t Group:				Material: Element Type -		Length:
	t Name:			ways	Liement Type -		Width:
Locatio	1	Below bri			Environment:		Height: Count: 1
Units All	Excellent 0	Good 1	Fair 0	Poor 0	Protect. System:		Total Quant. 1
Comme	ents:						
Low flow	at time of ins	pection.				Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab	Recomme	ndations:				Timing:	



Elemer	nt Data						
Element Group: Embankments and Streams Element Name: Embankments					Material: Element Type -		Length: Width:
Location: All four quadrants Units Excellent Good Fair Poor					Environment:		Height:
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 4
All	0	4	0	0	Troccoci system		Total Quant. 4
Comme	ents:						
No conce	rns.					Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab I	Recomme	ndations:				Timing:	
						riming:	
Elemer	nt Data						
	nt Data t Group:	Approach	es		Material: Gravel		Length: 6m
Elemen	t Group:	Approach Wearing S			Material: Gravel Element Type -		Length: 6m Width: 2.7m
Elemen	t Group: t Name:	Wearing 9	Surface		Element Type -		•
Elemen Elemen	t Group: t Name:	Wearing S	Surface	Poor	Element Type - Environment: Severe		Width: 2.7m
Elemen Elemen Locatio	t Group: t Name: n:	Wearing S	Surface west	Poor 0	Element Type -		Width: 2.7m Height:
Elemen Elemen Location Units Sq.m	t Group: t Name: n: Excellent	Wearing S East and v Good	Surface west Fair		Element Type - Environment: Severe		Width: 2.7m Height: Count: 2
Elemen Elemen Location Units Sq.m	t Group: t Name: n: Excellent 0	Wearing S East and v Good 32.4	Surface west Fair 0	0	Element Type - Environment: Severe		Width: 2.7m Height: Count: 2
Elemen Elemen Location Units Sq.m	t Group: t Name: n: Excellent	Wearing S East and v Good 32.4	Surface west Fair 0	0	Element Type - Environment: Severe	Limited Inspection	Width: 2.7m Height: Count: 2
Elemen Elemen Location Units Sq.m	t Group: t Name: n: Excellent 0	Wearing S East and v Good 32.4	Surface west Fair 0	0	Element Type - Environment: Severe	Limited Inspection Performance Def:	Width: 2.7m Height: Count: 2
Elemen Elemen Location Units Sq.m Comme	t Group: t Name: n: Excellent 0 ents: wearing surf	Wearing S East and v Good 32.4	Surface west Fair 0	0	Element Type - Environment: Severe	Performance Def: Maintenance:	Width: 2.7m Height: Count: 2
Elemen Elemen Location Units Sq.m Comme	t Group: t Name: n: Excellent 0	Wearing S East and v Good 32.4	Surface west Fair 0	0	Element Type - Environment: Severe	Performance Def:	Width: 2.7m Height: Count: 2



Recommended Work by Element

Element Name Recommended work Timing Estimated Cost

Deck Top - Thin Slab Replace deck 6-10 Years \$15,000.00

Recommended General Work

Recommended Work Description Timing Estimated Cost
Minor Rehab Install railing system Within 1 Year \$15,000.00

Associated Work		
Associated Work	Comments	Estimated Cost
Approaches:		\$0.00
Detours:		\$0.00
Traffic Control:		\$0.00
Utilities:		\$0.00
Right of Way:		\$0.00
Environmental Study:		\$0.00
Other:		\$0.00
Contingencies:		\$0.00
		Associated Work Total: \$0.00

Total Estimated Cost

Total cost of Recommended Works \$30,000.00





South elevation



North elevation





Looking east over bridge



Looking west over bridge



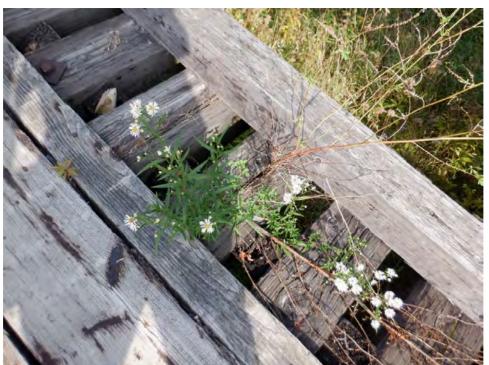


Deck wearing surface



Split board in northeast





Vegetation growing in railway tie



West abutment wall





East abutment wall



Erosion at base of east abutment wall





northwest wingwall



Southeast wingwall





Disintegration in south end of east abutment



Typical soffit detail





Northwest retaining wall



Southwest wingwall



Inventory Data

Structure Name: Camden East - Yarker West Culvert

Road Name: Cataraqui Trail

Structure Location: 890m East of Curl Road

Owner(s) CRCA

Latitude: 44.356455347 Longitude: -76.792701949 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: Rectangular Culvert Posted Speed: 50km/h AADT: Total Deck Length: 1m No. of Lanes: 1 % Trucks:

Overall Str. Width: 5.6m Min. Vertical Clearance: 0

Total Deck Area: 5.6sq.m Special Routes:

Roadway Width: 2.7m Transit □ Truck □ School □ Bicycle □

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West Span Lengths: 1 Fill on Structure: 0.3m

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:
Last Enhanced OSIM Inspection:
Current Load Limit
Enhanced Access Equipment:
Last Underwater Inspection:
By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI
Equipment Used: Camera, Handtools



	Priority	Estimated Cost
Material Condition Survey		\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Dec	:k	\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tot	al Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: None Timing

BCI: 67.72

Overall Comments: Date of next inspection: 2022-09-24

Concrete slab on masonry walls. Generally in good condition. Medium to wide cracks in slab.



Elemen	nt Data						
Element Element	t Group: t Name:	Barrels			Material: Masor Element Type Frame		Length: 5.6m Width: 1m
Location: Below roadway Environment: Benig						ı	Height: 1.4m
	Excellent		Fair	Poor	Protect. System:		Count: 1
Sq.m	0	16	2	1]		Total Quant. 19
Comme	nts:						
Medium t	o wide cracks	in concrete	soffit. Maso	nry appears	s to be in good condition.	Limited Inspection Performance Def:	
Rehab F	Recommen	ndations:				Maintenance: Timing:	
						IIIIIIig.	
Elemen							
	-	Embankm			Material:		Length:
Element	t Name:	Streams a	nd Water	ways	Element Type -		Width:
Location	n:	Through c	ulvert		_ Environment:		Height:
Units	Excellent		Fair	Poor	Protect. System:		Count: 1
All	0	1	0	0	Protect. System.		Total Quant. 1
Comme	nts:						
Dry at tim	ne of inspection	on.				Limited Inspection	
						Performance Def:	
Pehah [Recommen	-dations:				Maintenance:	
Kenab i	ecommen	Mations.				Timing:	
Elemen	t Data						
Element	t Group:			Streams	Material: Element Type -		Length:
		Embankm			Licinciii 1750		Width: Height:
Location Units	n: Excellent	All four qu Good	uadrants Fair	Poor	Environment:		Count: 4
All	0	4	0	0	Protect. System:		Total Quant. 4
					1		_
No concer							
140 00	113.					Limited Inspection	
						Performance Def:	
Rehab F	Recommen	ndations:				Maintenance:	
	1000	144.1.1				Timing:	
i							



Eleme	nt Data							
	nt Name:	Approach Wearing S Over culve	Surface		Material: Gravel Element Type -		J	10m 2.7m
Units	Excellent	Good	Fair	Poor	Environment: Severe		Count:	1
Sq.m	0	54	0	0	Protect. System:		Total Quant.	54
Comme	ents:							
	y in good con					Limited Inspection Performance Def: Maintenance: Timing:		



Associated Work	Commonto	Fatimental Cost	
Associated Work	Comments	Estimated Cost	
Approaches:		\$0.00	
Detours:		\$0.00	
Traffic Control:		\$0.00	
Utilities:		\$0.00	
Right of Way:		\$0.00	
Environmental Study:		\$0.00	
Other:		\$0.00	
Contingencies:		\$0.00	
	Associated Work Total:	\$0.00	

Total Estimated Cost

Total cost of Recommended Works \$0.00





North elevation

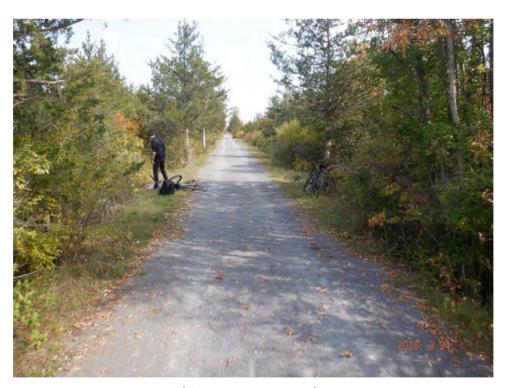


South elevation





Looking west over culvert



Looking east over culvert





East wall



West wall





Typical soffit detail



Cracking in soffit





Wide crack in soffit



Inventory Data

Structure Name: Camden East - Yarker East Culvert

Road Name: Cataraqui Trail

Structure Location: 1.55 km West of Sidings Street

Owner(s) CRCA

Latitude: 44.362176024 Longitude: -76.786632627 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: Rectangular Culvert Posted Speed: 50km/h AADT: Total Deck Length: 2m No. of Lanes: 1 % Trucks:

Overall Str. Width: 5.7m Min. Vertical Clearance: 0

Total Deck Area: 11.4sq.m Special Routes:

Roadway Width: 2.7m Transit □ Truck □ School □ Bicycle □

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West

Span Lengths: 1.4 Fill on Structure: 0m

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:
Last Enhanced OSIM Inspection:
Current Load Limit
Enhanced Access Equipment:
Last Underwater Inspection:
By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI
Equipment Used: Camera, Handtools



	Priority	Estimated Cost
Material Condition Survey		\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Deck		\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tota	I Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: None Timing

BCI: 74.17

Overall Comments: Date of next inspection: 2022-09-24

Culvert is generally in good condition.



Elemer	nt Data						
		Culverts			Material: Cast-in-	-place Concrete	Length: 5.7m
Element Group: Culverts Element Name: Barrels				Element Type Frames		Width: 1.4m	
Location		Below trail	il				Height: 1.1m
	Excellent		Fair	Poor	Environment: Benign		Count: 1
Sq.m	0	20	0.5	0	Protect. System:		Total Quant. 20.5
Comme	entc.						
		oneycombing	g and light <i>F</i>	AAR.		Limited Inspection	\Box
						•	
						Performance Def: Maintenance:	
Rehab F	Recommer	ıdations:				Timing:	
Elemer	t Data						
Element	t Group:	Embankme	ents and f	Streams	Material:		Length:
Element	t Name:	Streams ar	nd Water	ways	Element Type -		Width:
Location		Through cu		-	Environment:		Height:
	Excellent		Fair	Poor	Protect. System:		Count: 1
All	0	1	0	0	·		Total Quant. 1
Comme							
Dry at tim	ne of inspection	n.				Limited Inspection	
						Performance Def:	
						Maintenance:	
Renab H	Recommer	idations:				Timing:	
Elemen							
		Embankme		Streams	Material: Element Type -		Length:
		Embankme			Licinciii i i po		Width: Height:
Location Units	n: Excellent	All four qu Good		Door	Environment:		Count: 4
All	0	4	Fair 0	Poor 0	Protect. System:		Total Quant. 4
No concer							
NO CONCE	115.					Limited Inspection	
						Performance Def:	
Rehab F	Recommer	ndations:				Maintenance:	
1.01.00		- Garana				Timing:	
= 1					i i		



Eleme	nt Data							
Element Group: Approaches Element Name: Wearing Surface Location: Over culvert		Material: Gravel Element Type - Environment: Severe		0	10m 2.7m			
Units	Excellent	Good	Fair	Poor	Protect. System:		Count:	1
Sq.m	0	27	0	0	Frotect. System.		Total Quant.	27
Commo	ents:							
Well grad	ded. Good co	ndition.				Limited Inspection Performance Def: Maintenance:		
Rehab Recommendations:			Timing:					



Associated Work	Comments	Estimated Cost	
Approaches:	•	\$0.00	
Detours:		\$0.00	
Traffic Control:		\$0.00	
Utilities:		\$0.00	
Right of Way:		\$0.00	
nvironmental Study:		\$0.00	
Other:		\$0.00	
Contingencies:		\$0.00	
	Associa	ted Work Total: \$0.00	

Total Estimated Cost

Total cost of Recommended Works \$0.00





South elevation



North elevation





Looking west over culvert



Looking east over culvert





West wall



East wall





Typical soffit detail



Site Number: CRCA-SM8 **OSIM** Inspections

Inventory Data

Structure Name: **CNR Viaduct** Road Name: Cataraqui Trail

Structure Location: 50m East of Cutler Road

Owner(s) CRCA, County of Lennox and Addington

Latitude: 44.373338639 Longitude: -76.771862043 Crossing Type: Navig. Water MTO Region: Heritage Designation: Not Cons. Eastern MTO District: Kingston Road Class: Local

Structure Type: **I-Beams or Girders** Posted Speed: 50km/h AADT:1356

No. of Lanes: 1 % Trucks: 6 Total Deck Length: 127.7m Overall Str. Width: 3.6m Min. Vertical Clearance:

Special Routes:

Total Deck Area: 460sq.m

7m Transit □ Truck □ School ✓ Bicycle □ Roadway Width:

Skew Angle: Detour Length Around Bridge:

7 Direction of Structure: No. Spans: East-West

Span Lengths: 7 @ 17.9m Fill on Structure: 0m

Historical Data

Year Built: 1900 Year of Last Major Rehab:

Last OSIM Inspection: 2018-08-16 Last Evaluation: Last Enhanced OSIM Inspection: **Current Load Limit Enhanced Access Equipment:** Load Limit By-Law # Last Underwater Inspection: By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-07-27 Weather: Sunny Inspector: John Landry, EIT Temperature: 30

Others in Party: Shane Wall, RCJI Equipment Used: Camera, Handtools



Additional Investigations Required	Priority	Estimated Cost
Material Condition Survey	-	\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Deck		\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation	Normal	\$8,000.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Nates	Tota	N Cost, \$8 000 00

Investigation Notes: Total Cost: \$8,000.00

Recommend Timber Investigation on railway ties to determine extent of decay.

Overall Structure Notes

Recommended Work on Structure: Major Rehab Timing 1-5 Years

BCI: 51.06

Overall Comments: Date of next inspection: 2022-07-27

Shared structure with Lennox and Addington. L&A Structure Number 000605. Structure is maintained for recreational use by the Cataraqui River Conservation Authority. Piers and superstructure designed for railway loads. It is strongly recommended that the steel elements have an enhanced inspection completed during deck rehab.



Elemer	nt Data						
Element	t Group:	Decks			Material: Wood		Length: 127.7m
Element	t Name:	Wearing S	urface		Element Type -		Width: 3.3m
Location	n:	On deck su	urface		5		Height:
	Excellent		Fair	Poor	Environment: Severe		Count: 1
Sq.m	0	360	80	20	Protect. System:		Total Quant. 460
Comme	nts:						
Moderate boards.	to severe ro	t noted in de	ck boards. L	oose boards	s and vegetation growing in deck	Limited Inspection	
Dudius.						Performance Def:	
						Maintenance:	
Rehab F	Recommer	ıdations:				Timing: 1-5	Years
Elemer	t Data						
Element	t Group:	Decks			Material: Wood		Length: 127.1m
Element	t Name:	Deck Top -	- Thin Slal	٥	Element Type Wood Pl	lanks	Width: 3.3m
Location	n:	Below dec	k boards		Environment: Severe		Height:
Units	Excellent	Good	Fair	Poor	Protect. System: Creosote	Δ	Count: 1
Sq.m	0	360	80	20	J Trocect. System. eresset.	C	Total Quant. 460
Comme	nts:						
	_	_	_		de edge of wearing surface.	Limited Inspection	✓
Limited in surface.	spection due	to wearing s	urface. Assı	umed to be in	in similar condition as wearing	Performance Def:	
						Maintenance:	
Rehab F	Recommer	ndations:					Years
Replace	Deck					11111111g. – -	rears
Elemer	nt Data						
	t Group:	Barriers			Material: Steel		Length: 127.7m
		Railing Sys	stems		Element Type Pedestri	ian Fencing	Width:
Location		North and					Height: 1.3m
	Excellent		Fair	Poor	Environment: Severe		Count: 2
m	0	255.4	0	0	Protect. System:		Total Quant. 255.4
Comme	ents.						
		enerally in go	ood conditic	on. Fencing li	ikely does not meet current	Limited Inconnetion	
				_	next deck replacement.	Limited Inspection	
						Performance Def:	
Rehab F	Recommer	ndations:				Maintenance:	
	Railing Sv					Timing: 1-5	Years



Elemen	t Data						
Element	t Group:	Beams			Material: Steel		Length: 127.7m
Element	t Name:	Girders			Element Type I-Type		Width: 0.4m
Location	n:	Underside	of bridge	3	Environment: Moder	roto.	Height: 1.9m
Units	Excellent		Fair	Poor	Protect. System:	ate	Count: 2
Sq.m	0	1169.2	140	70	Frotect. System.		Total Quant. 1379.2
Comme	nts:						1
					ttom flange. Debris sitting on	Limited Inspection	✓
	l surfaces. Pe om the grour		ted in stiffe	ners and bra	acing elements. Middle 5 spans	Performance Def:	
						Maintenance:	1
Rehab P	Recommei	ndations:				Timing:	1
						ı IIIIIII 6.	1
Elemen	ıt Data						
Element	t Group:	Beams			Material: Steel		Length:
Element	t Name:	Diaphragm	กร		Element Type Cross T	Гуре	Width:
Location	n:	Between g	girders		5		Height:
	Excellent		Fair	Poor	Environment: Moder	ate	Count: 49
Each	0	42	5	2	Protect. System:		Total Quant. 49
Comme	nts						
		to moderate s	section loss	. Light to mo	oderate corrosion throughout.	Limited Inspection	✓
	-			-	-	Limited Inspection	•
						Performance Def:	
Rehab F	Recomme	ndations:				Maintenance:	1
						Timing:	1
Elemen	t Data						
		Bracing			Material: Steel		Length:
Element	-	Bracing			Element Type Channe	el	Width:
		Diacing					Height:
Location Units	n: Excellent	Good	Fair	Poor	Environment: Moder	ate	Count:
Sq.m	0	43	Fair 8	5	Protect. System:		Total Quant. 56
		43	0				
Comme		1-1	· · · · · · · · · · · · · · · · · · ·	Couldada	•		
Perforatio	n and mode	rate to severe	section los	s noted in pr	acing.	Limited Inspection	✓
						Performance Def:	
Dobob E		- dations				Maintenance:	
кепар к	Recomme	nuations:				Timing:	



	•						
Elemer	nt Data						
Element	t Group:	Abutment	S			n-place Concrete	Length: 4.9m
Element	t Name:	Abutment	Walls		Element Type Conve	entional Closed	Width: 0.9m
Location	ղ։	East and w	vest .		Environment, Mada	wata	Height: 2.1m
Units	Excellent	Good	Fair	Poor	Environment: Mode	rate	Count: 2
Sq.m	0	0	16.6	4	Protect. System:		Total Quant. 20.6
Comme	nts:						
Abutment	ts have mode	erate to sever	e scaling an	d light to mod	derate disintegration.	Limited Inspection	
						Performance Def:	_
						Maintenance:	
Rehab F	Recomme	ndations:					Years
						mining. 0-10	Tears
Elemer	nt Data						
		Abutments	ς		Material: Cast-i	n-place Concrete	Length: 7.7m
	=	Ballast Wa			Element Type -	in place concrete	Width:
					•		Height: 2.4m
Location		On abutmo		Door	Environment: Mode	rate	Count: 2
	Excellent		Fair	Poor	Protect. System:		Total Quant. 37
Sq.m	0	0	18.5	18.5			Total Quant. 37
Comme	nts:						
Moderate throughou		aling and ligh	t to modera	ite disintegrat	ion. Narrow to medium cracks	Limited Inspection	
tilloughot	ut.					Performance Def:	
						Maintenance:	
Rehab F	Recomme	ndations:				Timing:	
						6.	
Elemer	nt Data						
Element	t Group:	Piers			Material: Cast-i	n-place Concrete	Length: 5m
		Shafts/ Co	lumns/ Pi	le Bents		ete Rectangular Columns	
Location		,	,		Сар		Height: 5m
Units	Excellent	Good	Fair	Poor	Environment: Mode	rate	Count: 6
Sq.m	0	0	210	210	Protect. System:		Total Quant. 420
		0	210	210			
Comme					<u>, , , , , , , , , , , , , , , , , , , </u>		
	e moderate to d with cold jo		tegration th	roughout. Cr	acking and spalling likely	Limited Inspection	
						Performance Def:	
						Maintenance:	
	Recomme						Years
Re-face Substructure					<u> </u>		



	эрссиона	<i>'</i>				Site Number. C		
Elemer	nt Data							
Elemen	t Group:	Embankm	ents and	Streams	Material:		Length:	
Elemen	t Name:	Streams a	nd Water	ways	Element Type -		Width:	
Location	n:	Below brid	dge		Environment:		Height:	
Units	Excellent	Good	Fair	Poor	Protect. System:	Count: 1		
All	0	1	0	0			Total Quant. 1	
Comme	nts:							
Napanee	River. Flows	north to sout	:h			Limited Inspection		
						Performance Def:		
						Maintenance:		
Rehab I	Recommer	ndations:				Timing:		
	_							
Elemer								
	t Group:			Streams	Material: Element Type -		Length:	
	t Name:				Liement Type -		Width:	
Location	1	All four qu		D	Environment:		Height: 4	
Units All	Excellent 0	Good 4	Fair 0	Poor 0	Protect. System:		Total Quant. 4	
		4		U				
Comme								
No conce	rns.					Limited Inspection		
						Performance Def:		
Rehab i	Recommer	ndations:				Maintenance:		
						Timing:		
Elemer	nt Data							
	t Group:	Signs			Material: Steel		Length: 4m	
	t Name:	•			Element Type -		Width:	
Locatio		all four qu	uadrants c	ver struct	ture		Height:	
Units	Excellent	Good	Fair	Poor	Environment: Severe		Count: 4	
Each	0	4	0	0	Protect. System:		Total Quant. 4	
Comme	nts:							
	in good cond	dition.				Limited Inspection		
						·		
						Performance Def: Maintenance:		
Rehab F	Recommer	ndations:				Timing:		



Eleme	nt Data							
Element Group: Approaches Element Name: Wearing Surface Location: Below bridge		Material: Asphalt Element Type -						
Units	Excellent	Good	Fair	Poor	Protect. System:		Count:	1
Sq.m	0	70	0	0	Frotect. System.		Total Quant.	.70
No conce		ndations:				Limited Inspection Performance Def: Maintenance: Timing:		



Recommended Work by Element							
Element Name	Recommended work	Timing	Estimated Cost				
Shafts/ Columns/ Pile	Re-face Substructure	6-10 Years	\$300,000.00				
Deck Top - Thin Slab	Replace Deck	1-5 Years	\$140,000.00				
Railing Systems	Replace Railing System	1-5 Years	\$40,000.00				

Associated Work		
Associated Work	Comments	Estimated Cost
Approaches:		\$0.00
Detours:		\$0.00
Traffic Control:		\$0.00
Utilities:		\$0.00
Right of Way:		\$0.00
Environmental Study:		\$0.00
Other:	Mobilization, Bonding, Insurance	\$40,000.00
Contingencies:		\$40,000.00
	Associated Work Total:	\$80,000.00

Total Estimated Cost

Total cost of Recommended Works \$560,000.00





West section of south elevation



East section of south elevation





West abutment wall



Typical abutment bearing detail





Perforated girder stiffeners in northwest



Light cracking and disintegration in west abutment wall





West face of pier 1 (west to east)



East face of pier 1





West face of pier 2



East face of pier 2





West face of pier 3



East face of pier 3





West face of pier 4



East face of pier 4





West face of pier 5



East face of pier 5





East abutment wall



Typical soffit detail





Perforated diaphragm section in northeast

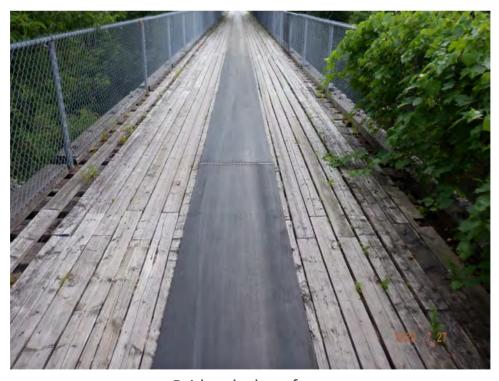


Looking east over bridge





Looking west over bridge



Bridge deck surface





Rot in deck boards



Rot in deck boards





Chain-link fence railing



Sidewalk below bridge





Wearing surface below bridge



Inventory Data

Structure Name: Yarker East Bridge
Road Name: Cataraqui Trail

Structure Location: 430m East of Colebrook Road

Owner(s) CRCA

Latitude: 44.375803004 Longitude: -76.758932238 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: I-Beams or Girders Posted Speed: 50km/h AADT: Total Deck Length: 4.7m No. of Lanes: 1 % Trucks:

Overall Str. Width: 3.65m Min. Vertical Clearance: 0

Total Deck Area: 17.2sq.m Special Routes:

Roadway Width: 3.65m Transit □ Truck □ School □ Bicycle □

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West

Span Lengths: 4.7 Fill on Structure:

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:
Last Enhanced OSIM Inspection:
Current Load Limit
Enhanced Access Equipment:
Last Underwater Inspection:
By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI Equipment Used: Camera, Handtools



	Priority	Estimated Cost
Material Condition Survey		\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Decl	k	\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tota	al Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: None Timing

BCI: 73.32

Overall Comments: Date of next inspection: 2022-09-24

Bridge is generally in good condition. Recommend spot replacing deck boards as needed. Unable to inspect underside of structure due to water level. Was able to determine there are a significant number of girders but was not able to determine exactly how many.



El a ma a m	t Doto					
Elemen						
		Decks			Material: Wood	Length: 4.7m
Element	Name:	Wearing S	urface		Element Type -	Width: 3.65m
Location	ո։	Deck surfa	ace		Environment: Severe	Height:
Units	Excellent	Good	Fair	Poor	Protect. System:	Count: 1
Sq.m	0	13.2	3	1	Frotect. System.	Total Quant. 17.2
Comme	nts:				1	
_				e nails and s	crews noted. Recommend spot	Limited Inspection
replacing	wearing surf	ace boards as	s needed.			
						Performance Def:
Rehab R	Recommer	ndations:				Maintenance: Repair of Bridge Timber
Replace	wearing s	urface				Timing: 6-10 Years
	+ 51-					
Elemen						
		Decks			Material: Wood	Length: 4.7m
Element	Name:	Deck Top	- Thin Slal)	Element Type Wood Pl	Width: 3.65m
Location	ո։	Deck surfa	ace		Environment: Moderat	Height:
Units	Excellent	Good	Fair	Poor	Protect. System:	Count: 1
Sq.m	0	17.2	0	0	Trotect. System.	Total Quant. 17.2
Comme	nts:					
		sumed to be	in good to f	air condition	n based on wearing surface.	Limited Inspection
						Performance Def:
Rehab R	Recommer	ndations:				Maintenance:
						Timing:
Elemen						
	Group:				Material: Wood	Length: 4.7m
Element	Name:	Railing Sys	stems			ail >83mm thick on Wood Width:
Location	ո:	North and	south		Post Environment: Severe	Height: 1.1m
Units	Excellent	Good	Fair	Poor	Protect. System:	Count: 2
m	0	8.9	0.5	0	i rotesti system.	Total Quant. 9.4
Comme	nts:	<u></u>				
		top railing. (Checking in r	northwest po	ost.	Limited Inspection
	<u> </u>	. 5	3			Limited Inspection
						Performance Def:
Rehah P	Recommer	ndations				Maintenance:
WELIAD L	(CCOIIIIIEI	144110113.				Timing:



Elemen	t Data						
Element	t Group:	Beams			Material: Wood		Length: 4.7m
Element	t Name:	Girders			Element Type Rectan	igular-Solid	Width: 0.25m
Location	n:	Below bric	dge		Contrarements Denign		Height: 0.4m
	Excellent		Fair	Poor	Environment: Benign		Count:
Sq.m					Protect. System:		Total Quant.
Comme	nts:						
Unable to	determine n	_	ders due to	lack of clear	rance. Exterior girders appeared	Limited Inspection	✓
to be in go	ood conditior	1.				Performance Def:	<u>•</u>
						Performance Def: Maintenance:	
Rehab F	Recommer	ndations:				Timing:	
						Illinig.	
Elemen	t Data						
		Abutment	ts		Material: Wood		Length:
		Abutment			Element Type Post an	nd Lagging	Width: 3.65m
Location		East and w					Height: 0.7m
	n: Excellent		Fair	Poor	Environment: Severe		Count: 2
Sq.m	0	5.1	0	0	Protect. System:		Total Quant. 5.1
					1		_
Comme			* : ad to		1		
Unable to	view due to	water level. A	Assumea 10	be in good c	ondition.	Limited Inspection	✓
						Performance Def:	
		1 1/2 2001				Maintenance:	
Renab r	Recommer	idations:				Timing:	
Elemen	t Data						
Element	t Group:	Embankm	ents and	Streams	Material:		Length:
Element	t Name:	Streams ar	nd Water	ways	Element Type -		Width:
Location	າ:	Below brid	dge		Environment:		Height:
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
All	0	1	0	0	Trotecti system.		Total Quant. 1
Comme	nts:						
		ttle clearance	e for the ins	pection of th	ne substructure.	Limited Inspection	
						•	
						Performance Def:	1
Rehab F	Recommer	ndations:				Maintenance:	
						Timing:	
4							ŗ



Elemer	nt Data						
Element	t Name:	Embankm Embankm	nents	Streams	Material: Element Type -		Length: Width: Height:
Location		All four qu		D-0"	Environment:		Count: 4
	Excellent		Fair	Poor	Protect. System:		Total Quant. 4
All	0	4	0	0			Total Quant.
Comme	nts:						
No concer	rns.					Limited Inspection	
						Performance Def:	_
						Maintenance:	
Rehab F	Recommer	ndations:				Timing:	
						Illinig.	
				•			
Elemer	nt Data						
Elemen		Approach	es		Material: Gravel		Length: 6m
Element	t Group:				Material: Gravel Element Type -		Length: 6m Width: 2.7m
Element Element	t Group: t Name:	Wearing S	Surface				Width: 2.7m
Element Element Location	t Group: t Name: n:	Wearing S East and v	Surface west	Poor			Width: 2.7m Height:
Element Element Location Units	t Group: t Name: n: Excellent	Wearing S East and v Good	Surface west Fair	Poor	Element Type -		Width: 2.7m Height: Count: 2
Element Element Location	t Group: t Name: n:	Wearing S East and v	Surface west	Poor 0	Element Type - Environment: Severe		Width: 2.7m Height:
Element Element Location Units Sq.m	t Group: t Name: n: Excellent 0	Wearing S East and v Good 32.4	Surface west Fair 0		Element Type - Environment: Severe		Width: 2.7m Height: Count: 2
Element Element Location Units Sq.m	t Group: t Name: n: Excellent 0	Wearing S East and v Good 32.4	Surface west Fair 0		Element Type - Environment: Severe	Limited Inspection	Width: 2.7m Height: Count: 2
Element Element Location Units Sq.m	t Group: t Name: n: Excellent 0	Wearing S East and v Good 32.4	Surface west Fair 0		Element Type - Environment: Severe	•	Width: 2.7m Height: Count: 2
Element Element Location Units Sq.m Comme	t Group: t Name: n: Excellent 0 ents: ed. Generally	Wearing S East and v Good 32.4	Surface west Fair 0		Element Type - Environment: Severe	Performance Def:	Width: 2.7m Height: Count: 2
Element Element Location Units Sq.m Comme	t Group: t Name: n: Excellent 0	Wearing S East and v Good 32.4	Surface west Fair 0		Element Type - Environment: Severe	Performance Def: Maintenance:	Width: 2.7m Height: Count: 2
Element Element Location Units Sq.m Comme	t Group: t Name: n: Excellent 0 ents: ed. Generally	Wearing S East and v Good 32.4	Surface west Fair 0		Element Type - Environment: Severe	Performance Def:	Width: 2.7m Height: Count: 2



Associated Work	Comments	Estimated Cost
Approaches:		\$0.00
Detours:		\$0.00
Traffic Control:		\$0.00
Utilities:		\$0.00
Right of Way:		\$0.00
Environmental Study:		\$0.00
Other:		\$0.00
Contingencies:		\$0.00
	Ass	sociated Work Total: \$0.00

Total Estimated Cost

Total cost of Recommended Works \$0.00



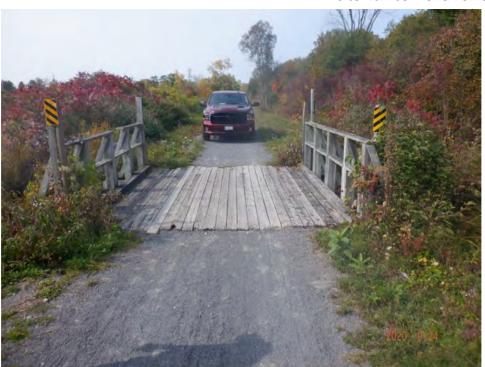


South elevation



North elevation





Looking wst over bridge



Looking east over bridge





Deck wearing surface



Rot in deck surface





Rot in west deck end



North railing system





South railing system



Inventory Data

Structure Name: Harrowsmith West Culvert

Road Name: Cataraqui Trail

Structure Location: 200m East of MacLean Road

Owner(s) CRCA

Latitude: 44.397455187 Longitude: -76.692845723 Crossing Type: Non-Navig. Water

MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: Rectangular Culvert Posted Speed: 50km/h AADT: Total Deck Length: 3m No. of Lanes: 1 % Trucks:

Overall Str. Width: 8.2m Min. Vertical Clearance: 0

Total Deck Area: 24.6sq.m Special Routes:

Roadway Width: 2.7m Transit □ Truck □ School □ Bicycle □

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West Span Lengths: 2.2m Fill on Structure: 0.6m

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:
Last Enhanced OSIM Inspection:
Current Load Limit
Enhanced Access Equipment:
Last Underwater Inspection:
By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI
Equipment Used: Camera, Handtools



	Priority	Estimated Cost
Material Condition Survey		\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Deck		\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tot	tal Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: None Timing

BCI: 71.16

Overall Comments: Date of next inspection: 2022-09-24

Culvert is in good condition. No anticipated work needed.



Elemen	nt Data						
Element Element	t Group: t Name:	Inlet Comp			Material: Cast-ir Element Type -	n-place Concrete	Length: 3m Width:
Location		North end	1		Environment: Moder	rate	Height: 1.9m
Units	Excellent	Good	Fair	Poor	Protect. System:	iate	Count: 2
Sq.m	0	3.45	2	0.25			Total Quant. 5.7
Comme	nts:						
Narrow to	o medium cra	cks noted.				Limited Inspection Performance Def:	
Rehab R	Recommen	dations:				Maintenance: Timing:	
Elemen	nt Data						
Element	t Group:	Culverts			Material: Cast-ir	n-place Concrete	Length: 3m
		Outlet Con	mponents	;	Element Type -		Width:
Location	n:	South end			Environment: Benigr	2	Height: 1.9m
Units	Excellent	Good	Fair	Poor	Protect. System:	1	Count: 2
Sq.m	0	4.7	1	0	Plutect. System.		Total Quant. 5.7
Comme	nts:						
	in good cond	lition. Light so	caling and n	arrow cracks	s.	Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab R	Recommen	idations:				Timing:	
						<u> </u>	
Elemen	t Data						
	t Group: t Name:	Culverts Barrels			Material: Cast-ir Element Type Frame	n-place Concrete es - Rigid	Length: 8.2m Width: 2.2m
Location		Below trail	il				Height: 1.9m
	Excellent		Fair	Poor	Environment: Benigr	n	Count: 1
Sq.m	0	46.7	2	0.5	Protect. System:		Total Quant. 49.2
Comme	ents.						
		good conditic	on. Medium	cracks noted	d in southeast.	Limited Inspection	
						•	
						Performance Def:	
Rehab P	Recommen	ndations:				Maintenance: Timing:	
						illillig.	



Elemer	nt Data						
Elemen	t Group:	Embankm	ents and	Streams	Material:		Length:
Elemen	t Name:	Streams a	nd Water	ways	Element Type -		Width:
Locatio	n:	Through c	culvert		Environment:		Height:
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 1
All	0	1	0	0	Troccott System.		Total Quant. 1
Comme	ents:						
Dry at tim	ne of inspecti	on.				Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab I	Recomme	ndations:				Timing:	
Elemer	nt Data						
Elemen	t Group:	Embankm	nents and	Streams	Material:	<u></u>	Length:
Elemen	t Name:	Embankm	ients		Element Type -		Width:
Locatio	n:	All four qu	uadrants		Environment:		Height:
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 4
All	0	4	0	0	Frotect. System.		Total Quant. 4
Comme	ents:						
No conce						Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab I	Recomme	ndations:				Timing:	
						,	
Elemer	nt Data						
Elemen	t Group:	Approach	es		Material: Gravel		Length: 10m
Elemen	t Name:	Wearing S	Surface		Element Type -		Width: 2.7m
Locatio	n:	Over culve	ert		Facility and Course		Height:
Units	Excellent		Fair	Poor	Environment: Severe		Count: 1
Sq.m	0	22	5	0	Protect. System:		Total Quant. 27
Comme	ents:						
		ough surface	÷.			Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab I	Recomme	ndations:				Timing:	
						· ······o·	



Associated Work				
Associated Work	Comments		Estimated Cost	
Approaches:			\$0.00	
Detours:			\$0.00	
Traffic Control:			\$0.00	
Utilities:			\$0.00	
Right of Way:			\$0.00	
Environmental Study:			\$0.00	
Other:			\$0.00	
Contingencies:			\$0.00	
		Associated Work Total:	\$0.00	

Total Estimated Cost

Total cost of Recommended Works \$0.00





North elevation



South elevation





Looking east over culvert



Looking west over culvert





West wall



East wall





Typical soffit detail



Cracking in southeast





Honeycombing in east wall



Inventory Data

Structure Name: Harrowsmith East Culvert

Road Name: Cataraqui Trail

Structure Location: 670m East of Colebrook Road

Owner(s) CRCA

Latitude: 44.40545805 Longitude: -76.680227713 Crossing Type: Road
MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class: Local

Structure Type: Rectangular Culvert Posted Speed: 50km/h AADT: Total Deck Length: 4m No. of Lanes: 1 % Trucks:

Overall Str. Width: 10.4m Min. Vertical Clearance: 0

Total Deck Area: 41.6sq.m Special Routes:

Roadway Width: 2.7m Transit □ Truck □ School □ Bicycle □

Skew Angle: 0 Detour Length Around Bridge:

No. Spans: 1 Direction of Structure: East-West

Span Lengths: 3.65m Fill on Structure: 1m

Historical Data

Year Built: Year of Last Major Rehab:

Last OSIM Inspection:
Last Enhanced OSIM Inspection:
Current Load Limit
Enhanced Access Equipment:
Last Underwater Inspection:
By-Law Expiry Date:

Last Condition Survey:

Rehab History (Date/Description:

Field Inspection Information

Date of Inspection: 2020-09-24 Weather: Cloudy Inspector: John Landry, EIT Temperature: 20

Others in Party: Shane Wall, RCJI Equipment Used: Camera, Handtools



	Priority	Estimated Cost
Material Condition Survey	,	\$0.00
Detailed Deck condition Survey		\$0.00
Non-Destructive Delamination Survey of Asphalt-Covered Decl	k	\$0.00
Concrete Substructure Condition Survey		\$0.00
Detailed Coating Conditon Survey		\$0.00
Detailed Timber Investigation		\$0.00
Post-Tensioned Strand Investigation		\$0.00
Underwater Investigation		\$0.00
Fatigue Investigation		\$0.00
Seismic Investigation		\$0.00
Structure Evaluation		\$0.00
Monitoring		\$0.00
Monitoring of Deformations, Settlements and Movements		\$0.00
Monitoring Crack Widths		\$0.00
Investigation Notes:	Tota	al Cost: \$0.00

Overall Structure Notes

Recommended Work on Structure: Major Rehab Timing 6-10 Years

BCI: 38.12

Overall Comments: Date of next inspection: 2022-09-24

culvert is in fair to poor condition. The culvert ends as well as the inlet/outlet walls have started to disintegrate. Ends will likely require repair within the next 10 years.



Elemer	nt Data						
Element	t Group:	Culverts			Material: Cast-ii	n-place Concrete	Length: 5.8m
Element	t Name:	Inlet Comp	onents		Element Type -		Width:
Location	ո։	North end			Environment: Mode	rato	Height: 3.8m
Units	Excellent	Good	Fair	Poor	Protect. System:	ate	Count: 2
Sq.m	0	0	6	16	Trotect. System.		Total Quant. 22
Comme	nts:						
Severe dis	integration t	hroughout in	let walls.			Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab F	Recommer	ndations:				Timing:	
Elemer							
	t Group:				Material: Cast-ii Element Type -	n-place Concrete	Length: 5.8m
		Outlet Cor	nponents		Element Type -		Width:
Location		South end			Environment: Mode	rate	Height: 3.8m Count: 2
	Excellent	Good	Fair	Poor	Protect. System:		Total Quant. 22
Sq.m	0	0	11	11			rotal Qualit. 22
Comme							
Severe dis	sintegration t	hroughout ou	ıtlet walls. I	Most notably	the southeast wall.	Limited Inspection	
						Performance Def:	
Rehah F	Recommer	ndations:				Maintenance:	
Remabil	(CCOIIIIICI	idations.				Timing:	
Elemer	nt Data						
	t Group:	Culverts			Material: Cast-i	n-place Concrete	Length: 10.4m
		Barrels			Element Type Frame		Width: 3.65m
Location		Below trail	ı				Height: 3.7m
Units	Excellent	Good	Fair	Poor	Environment: Benigr	1	Count: 1
Sq.m	0	49.9	40	25	Protect. System:		Total Quant. 114.9
Comme	nts.						
		t culvert end	s. Light to n	noderate loca	alized scaling.	Limited Inspection	
						Limited Inspection	
						Performance Def:	
Rehab F	Recommer	ndations:				Maintenance: Timing: 6-10) Years
		o culvert e				11111115. U-10	, 10013



Eleme	nt Data						
	t Group:			Streams	Material:		Length:
Elemen	it Name:	Embankm	nents		Element Type -		Width:
Locatio	n:	All four qu	uadrants		Environment:		Height:
Units	Excellent	Good	Fair	Poor	Protect. System:		Count: 4
All	0	4	0	0	Frotect. System.		Total Quant. 4
Comme	ents:						
No conce	rns.					Limited Inspection	
						Performance Def:	
						Maintenance:	
Rehab	Recomme	ndations:				Timing:	
Elemer	nt Data						
	nt Data	Approach	es		Material:		Length: 20m
Elemen	t Group:	Approach Wearing S			Material: Element Type -		Length: 20m Width: 2.7m
Elemen	t Group: It Name:		Surface		Element Type -		•
Elemen Elemen	t Group: It Name:	Wearing S	Surface	Poor	Element Type - Environment:		Width: 2.7m Height: Count: 1
Elemen Elemen Locatio	t Group: it Name: n:	Wearing S	Surface ert	Poor 0	Element Type -		Width: 2.7m Height:
Elemen Elemen Locatio Units	t Group: t Name: n: Excellent	Wearing S Over culv Good	Surface ert Fair		Element Type - Environment:		Width: 2.7m Height: Count: 1
Elemen Elemen Locatio Units Sq.m	t Group: t Name: n: Excellent	Wearing S Over culve Good 54	Surface ert Fair 0	0	Element Type - Environment:	Limited Inspection	Width: 2.7m Height: Count: 1
Elemen Elemen Locatio Units Sq.m	nt Group: nt Name: n: Excellent 0	Wearing S Over culve Good 54	Surface ert Fair 0	0	Element Type - Environment:	Limited Inspection	Width: 2.7m Height: Count: 1
Elemen Elemen Locatio Units Sq.m	nt Group: nt Name: n: Excellent 0	Wearing S Over culve Good 54	Surface ert Fair 0	0	Element Type - Environment:	Performance Def:	Width: 2.7m Height: Count: 1
Elemen Elemen Locatio Units Sq.m Comme	nt Group: nt Name: n: Excellent 0	Wearing S Over culve Good 54	Surface ert Fair 0	0	Element Type - Environment:	Performance Def: Maintenance:	Width: 2.7m Height: Count: 1
Elemen Elemen Locatio Units Sq.m Comme	nt Group: nt Name: n: Excellent 0 ents: eel rutting. Ge	Wearing S Over culve Good 54	Surface ert Fair 0	0	Element Type - Environment:	Performance Def:	Width: 2.7m Height: Count: 1



Recommended Wor	k by Element		
Element Name	Recommended work	Timing	Estimated Cost
Barrels	Concrete repairs to culvert ends.	6-10 Years	\$80,000.00

Associated Work	Comments	Estimated Cost
Approaches:		\$0.00
Detours:		\$0.00
Traffic Control:		\$0.00
Utilities:		\$0.00
Right of Way:		\$0.00
Environmental Study:		\$0.00
Other:	Mobilization, Bonding, Insurance	\$8,000.00
Contingencies:		\$8,000.00
	Associated Work Total:	\$16,000.00

Total Estimated Cost

Total cost of Recommended Works \$96,000.00



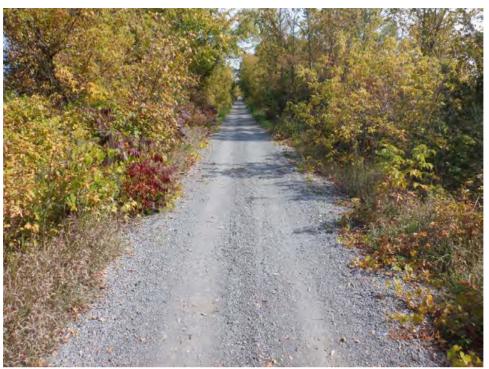


South elevation



Looking west over culvert





Looking east over culvert



West wall (typical)





East wall (typical)



Moderate scaling in wall





Typical soffit detail



Scaling and disintegration in soffit end





Severe disintegration in northeast wingwall



Northeast wingwall





Southwest wingwall



Southeast wingwall





Northwest wingwall

