Inventory Data

Structure Name:	Chaffey's Lock Bridge		
Road Name:	Cataraqui Trail		
Structure Location:	Over Iron Bridge Lane		
Owner(s)	Cataraqui Region Conservation Authority		
Latitude: 44.582839	Longitude: -76.318862	Crossing Type:	Navig. Water
MTO Region:	Eastern	Heritage Designation:	Not Cons.
MTO District:	Kingston	Road Class:	
Structure Type:	I-Beams or Girders	Posted Speed:	AADT:
Total Deck Length:	70.7m	No. of Lanes:	% Trucks:
Overall Str. Width:	3.8m	Min. Vertical Clearance:	
Total Deck Area:	268.7sq.m	Special Routes:	
Roadway Width:	3.8m	Transit ☐ Truck ☐ School ☐ Bicycle ☑	
Skew Angle:	0	Detour Length Around Bridge:	
No. Spans:	3	Direction of Structure:	East-West
Span Lengths:	18.5, 33.2, 19	Fill on Structure:	

Historical Data

Year Built:		Year of Last Major Rehab:	
Last OSIM Inspection:	2017-09-28	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:	2019-08-16	Weather:	Sunny
Inspector:	John Landry, EIT	Temperature:	24
Others in Party:	Lizzie Lindensmith		
Equipment Used:	Camera, Handtools		

JEWELL ENGINEERING

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	$7,500.00
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
	Total Cost:	$7,500.00

Investigation Notes:

Recommend detailed timber investigation to determine the extend of decay in railway ties.

Overall Structure Notes

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

BCI: 71.23

Overall Comments: Date of next inspection: 2021-08-16

Substructure is generally in good condition. Timber wearing surface is reaching the end of its service life and should be replaced. Recommend completing a timber investigation on the railway ties to determine complete scope of work.

Element Data

Element Group: Decks
Element Name: Wearing Surface
Location: Top of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	67.7	134	67

Material: Wood
Element Type -
Environment: Severe
Protect. System:

Length: 70.8m
Width: 3.8m
Height:
Count: 1
Total Quant. 268.7

Comments:
Timber decking is loose and rotting. Vegetation growing throughout is indicitive of decay.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing: 1-5 Years

Rehab Recommendations:
Replace Wearing Surface

Element Data

Element Group: Decks
Element Name: Deck Top - Thin Slab
Location: Top of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	67.7	134	67

Material: Wood
Element Type Wood Planks
Environment: Severe
Protect. System:

Length: 70.7m
Width: 3.8m
Height:
Count: 1
Total Quant. 268.7

Comments:
Creosoted timber railway ties. Unable to inspect due to wearing surface. Assumed to be in similar condition to wearing surface.

Limited Inspection ☑
Performance Def:
Maintenance:
Timing: 1-5 Years

Rehab Recommendations:
Replace Deck (Contingent on results of timber investigation)

Element Data

Element Group: Decks
Element Name: Soffit - Thin Slab
Location: Underside of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	134.35	134.35	0

Material: Wood
Element Type -
Environment: Benign
Protect. System:

Length: 70.7m
Width: 3.8m
Height:
Count: 1
Total Quant. 268.7

Comments:
Creosoted timber railway ties. Viewed from ground. Could not determine the extent of decay in deck soffit. Quantities assumed.

Limited Inspection ☑
Performance Def:
Maintenance:
Timing: 1-5 Years

Rehab Recommendations:
Replace Deck (Costed under deck top)

Element Data

Element Group: Sidewalks/curbs
Element Name: Curbs
Location: North and south

Units	Excellent	Good	Fair	Poor
Sq.m	0	0	21.21	21.21

Material: Wood
Element Type -
Environment: Severe
Protect. System:

Length: 70.7m
Width: 0.2m
Height: 0.1m
Count: 2
Total Quant. 42.42

Comments:
Severe rot in curbs.

Rehab Recommendations:
Replace curbs (Costed under wearing surface)

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Barriers
Element Name: Railing Systems
Location: North and south

Units	Excellent	Good	Fair	Poor
m	0	137.4	2	2

Material: Steel
Element Type Pedestrian Fencing
Environment: Severe
Protect. System:

Length: 70.7m
Width:
Height:
Count: 2
Total Quant. 141.4

Comments:
One damaged section in northeast quadrant. Barrier does not offer sufficient protection for cyclists or ATVs. Recommend replacing with deck system.

Rehab Recommendations:
Replace railing system.

Limited Inspection ☐
Performance Def: Pedestrian/Vehicular Hazard
Maintenance:
Timing: 1-5 Years

Element Data

Element Group: Beams
Element Name: Girders
Location: Center span

Units	Excellent	Good	Fair	Poor
Sq.m	0	526.4	0	0

Material: Weathering Steel
Element Type I-Type
Environment: Moderate
Protect. System:

Length: 35m
Width: 0.48m
Height: 2.8m
Count: 2
Total Quant. 526.4

Comments:
Good condition.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Beams
Element Name: Girders
Location: East and west spans

Units	Excellent	Good	Fair	Poor
Sq.m	0	420	0	0

Material: Weathering Steel
Element Type I-Type
Environment: Moderate
Protect. System:

Length: 17.5m
Width: 0.3m
Height: 2.4m
Count: 4
Total Quant. 420

Comments:
Girdres appear to be in good condition.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Beams
Element Name: Floor Beams
Location: Center span

Units	Excellent	Good	Fair	Poor
Sq.m	0	103.68	0	0

Material: Weathering Steel
Element Type I-Type
Environment: Moderate
Protect. System:

Length: 3.6m
Width: 0.2m
Height: 1.2m
Count: 9
Total Quant. 103.68

Comments:
Appear to be in good condition.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Beams
Element Name: Stringers
Location: Center span

Units	Excellent	Good	Fair	Poor
Sq.m	0	40	0	0

Material: Weathering Steel
Element Type I-Type
Environment: Moderate
Protect. System:

Length:
Width:
Height:
Count: 40
Total Quant. 40

Comments:
Stringers appear to be in good condition.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Beams
Element Name: Diaphragms
Location: East and west spans

Units	Excellent	Good	Fair	Poor
Each	0	9	0	0

Material: Weathering Steel
Element Type Cross Type
Environment: Benign
Protect. System:

Length:
Width:
Height:
Count: 18
Total Quant. 18

Comments:
9 Diaphragms per span. Viewed from the ground and appeared to be in good condition.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Bracing
Element Name: Bracing
Location: East and west spans

Units	Excellent	Good	Fair	Poor
Sq.m	0	20	0	0

Material: Weathering Steel
Element Type Channel
Environment: Benign
Protect. System:

Length:
Width:
Height:
Count: 20
Total Quant. 20

Comments:
10 sets of cross bracing per span. Viewed from the ground and appears to be in good condition.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Abutment Walls
Location: East and west

Units	Excellent	Good	Fair	Poor
Sq.m	0	41.59	2.5	0.5

Material: Cast-in-place Concrete
Element Type Conventional Closed
Environment: Moderate
Protect. System:

Length:
Width: 4.9m
Height: 4.55m
Count: 2
Total Quant. 44.59

Comments:
Light staining and cracking with light disintigration.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Ballast Walls
Location: On abutments

Units	Excellent	Good	Fair	Poor
Sq.m	0	21.5	3	0

Material: Cast-in-place Concrete
Element Type -
Environment: Moderate
Protect. System:

Length:
Width: 4.9m
Height: 2.5m
Count: 2
Total Quant. 24.5

Comments:
Generally in good condition. Light to moderate scaling and staining.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Wingwalls
Location: All four quadrants

Units	Excellent	Good	Fair	Poor
Sq.m	0	182.58	10	2

Material: Cast-in-place Concrete
Element Type Reinforced Concrete
Environment: Moderate
Protect. System:

Length: 13.8m
Width:
Height: 7.05m
Count: 4
Total Quant. 194.58

Comments:
Light staining and cracking with light disintigration.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Bearings
Location: north and south

Units	Excellent	Good	Fair	Poor
Each	0	4	0	0

Material: Steel
Element Type Plate
Environment: Moderate
Protect. System:

Length:
Width:
Height:
Count: 4
Total Quant. 4

Comments:
Appeared to be in good condition.

Rehab Recommendations:

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Piers
Element Name: Shafts/ Columns/ Pile Bents
Location: East and west Piers

Units	Excellent	Good	Fair	Poor
Sq.m	0	202.06	10.7	2

Material: Cast-in-place Concrete
Element Type Concrete Shafts, Pier Walls
Environment: Moderate
Protect. System:

Length: 4.9m
Width: 1m
Height: 9.1m
Count: 2
Total Quant. 214.76

Comments:
Open cold joints, light to moderate scaling.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Piers
Element Name: Bearings
Location: On piers

Units	Excellent	Good	Fair	Poor
Each	0	8	0	0

Material: Steel
Element Type Plate
Environment: Benign
Protect. System:

Length:
Width:
Height:
Count: 8
Total Quant. 8

Comments:
Pier bearings assumed to be in good condition.

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Foundations
Element Name: Foundations (Below Ground Level)
Location: Below abutments and piers

Units	Excellent	Good	Fair	Poor

Material:
Element Type
Environment:
Protect. System:

Length:
Width:
Height:
Count:
Total Quant.

Comments:
No visible signs of foundation instability at time of inspection.

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Embankments and Streams
Element Name: Streams and Waterways
Location: Below bridge

Units	Excellent	Good	Fair	Poor
All	0	100	0	0

Material:
Element Type -
Environment:
Protect. System:

Length:
Width:
Height:
Count: 1
Total Quant. 1

Comments:
No concerns.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Embankments and Streams
Element Name: Embankments
Location: All four quadrants

Units	Excellent	Good	Fair	Poor
All	0	4	0	0

Material:
Element Type -
Environment:
Protect. System:

Length:
Width:
Height:
Count: 4
Total Quant. 4

Comments:
Steep embankments.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Recommended Work by Element

Element Name	Recommended work	Timing	Estimated Cost
Railing Systems	Replace railing system.	1-5 Years	$100,000.00
Deck Top - Thin Slab	Replace Deck (Contingent on results of timber investigation)	1-5 Years	$100,000.00
Wearing Surface	Replace Wearing Surface	1-5 Years	$25,000.00

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	$10,000.00
Contingencies:		$20,000.00
	Associated Work Total:	$30,000.00

Total Estimated Cost

Total cost of Recommended Works $255,000.00

South elevation

East abutment wall

Southeast wingwall

Soffit (typical) of east span

East side of eastern pier

West side of eastern pier

Bearing on top of eastern pier, under northern girder

West abutment wall

Northwest wingwall

Southwest wingwall

Township of Rideau Lakes
2019 OSIM

Soffit (typical) of west span

1

Looking east across structure

Chaffey's Locks – CRCA Bridge

West side of western pier

Soffit (typical) of middle span

Looking west across structure

Wearing surface on structure (typical)

Rotten and loose timber on wearing surface

Damage to chain link fence on northeast side of structure

Inventory Data

Structure Name: Otter Creek Bridge
Road Name: Cataraqui Trail
Structure Location: 250m West of Old Hwy 15
Owner(s) Cataraqui Region Conservation Authority

Latitude: 44.777383 Longitude: -76.111516 Crossing Type: Non-Navig. Water
MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class:
Structure Type: I-Beams or Girders Posted Speed: AADT:
Total Deck Length: 7.8m No. of Lanes: 1 % Trucks:
Overall Str. Width: 3.6m Min. Vertical Clearance:
Total Deck Area: 28.1sq.m Special Routes:
Roadway Width: 3.6m Transit ☐ Truck ☐ School ☐ Bicycle ☑
Skew Angle: 0 Detour Length Around Bridge:
No. Spans: 1 Direction of Structure: North-South
Span Lengths: 7.8 Fill on Structure:

Historical Data

Year Built: Year of Last Major Rehab:
Last OSIM Inspection: 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: 2019-08-16 Weather: Sunny
Inspector: John Landry, EIT Temperature: 24
Others in Party: Lizzie Lindensmith
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
	Total Cost:	$0.00

Investigation Notes:

Overall Structure Notes

Recommended Work on Structure: Timing

BCI: 60.84

Overall Comments: Date of next inspection: 2021-08-16

Concrete in structure is disintegrating due to alkali aggregate reaction. Concrete does not appear to contain any reinforcing steel. Repair of structure would likely be costly and inefective. As the structure was initially intended to support train loading there are no concerns about servicibility. Recommend monitoring disintegration encroachment on bearings during future inspections. Minor railing maintenance needs.

Element Data

Element Group: Decks
Element Name: Wearing Surface
Location: Top of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	27.08	1	0

Material: Wood
Element Type -
Environment: Severe
Protect. System:

Length: 7.8m
Width: 3.6m
Height:
Count: 1
Total Quant. 28.08

Comments:
Small patches in deck. Moderate wear and abrasion noted.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Decks
Element Name: Deck Top - Thin Slab
Location: Top of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	28.08	0	0

Material: Wood
Element Type Wood Planks
Environment: Benign
Protect. System:

Length: 7.8m
Width: 3.6m
Height:
Count: 1
Total Quant. 28.08

Comments:
Railway ties covered by wearing surface. Assumed to be in good condition.

Rehab Recommendations:

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Decks
Element Name: Soffit - Thin Slab
Location: Underside of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	28.08	0	0

Material: Wood
Element Type -
Environment: Moderate
Protect. System:

Length: 7.8m
Width: 3.6m
Height:
Count: 1
Total Quant. 28.08

Comments:
Good condition.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Barriers
Element Name: Railing Systems
Location: East and west

Units	Excellent	Good	Fair	Poor
m	0	15.6	0	0

Material: Wood
Element Type Wood Rail >83mm thick on Wood Post
Environment: Severe
Protect. System:

Length: 7.8m
Width: 0.13m
Height: 1.1m
Count: 2
Total Quant. 15.6

Comments:
Railing is loose in northwest.Railing system does not meet railing spacing requirements of CHBDC. Recommend adding railings to meet code as maintenance.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance: Bridge Handrail Maintenance
Timing:

Element Data

Element Group: Beams
Element Name: Girders
Location: Underside of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	85.18	0	0

Material: Weathering Steel
Element Type I-Type
Environment: Benign
Protect. System:

Length: 7.8m
Width: 0.15m
Height: 0.61m
Count: 6
Total Quant. 85.18

Comments:
Minor corrosion throughout.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Beams
Element Name: Diaphragms
Location: Between girders

Units	Excellent	Good	Fair	Poor
Sq.m	0	25	0	0

Material: Weathering Steel
Element Type Rectangular-Solid
Environment: Benign
Protect. System:

Length:
Width:
Height:
Count: 25
Total Quant. 25

Comments:
Good condition.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Abutment Walls
Location: North and south

Units	Excellent	Good	Fair	Poor
Sq.m	0	8.42	10.2	7.3

Material: Cast-in-place Concrete
Element Type Conventional Closed
Environment: Moderate
Protect. System:

Length:
Width: 3.6m
Height: 3.6m
Count: 2
Total Quant. 25.92

Comments:
Disintigration in north abutment wall, Localized delamination in south abutment wall and disintegration along top of wall.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Ballast Walls
Location: On abutment walls

Units	Excellent	Good	Fair	Poor
Sq.m	0	7.6	0	0

Material: Cast-in-place Concrete
Element Type -
Environment: Moderate
Protect. System:

Length:
Width: 3.8m
Height: 1m
Count: 2
Total Quant. 7.6

Comments:
Generally in good condition.

Rehab Recommendations:

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Wingwalls
Location: All four quadrants

Units	Excellent	Good	Fair	Poor
Sq.m	0	3.7	15	13.5

Material: Cast-in-place Concrete
Element Type Reinforced Concrete
Environment: Moderate
Protect. System:

Length: 3.5m
Width:
Height: 4.6m
Count: 4
Total Quant. 32.2

Comments:
Northwest: Severe honeycombing, Northeast: Severe honeycombing, delamination and disintegration, Southwest: Severe delamination and disintegration. Southeast: Delamination throughout.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Bearings
Location: On abutments

Units	Excellent	Good	Fair	Poor
Each	0	12	0	0

Material:
Element Type Plate
Environment:
Protect. System:

Length:
Width:
Height:
Count: 12
Total Quant. 12

Comments:
Bearings appeared to be in good condition.

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Foundations
Element Name: Foundations (Below Ground Level)
Location: Below abutments

Units	Excellent	Good	Fair	Poor

Material:
Element Type
Environment:
Protect. System:

Length:
Width:
Height:
Count:
Total Quant.

Comments:
No visible indications of foundation instability.

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Embankments and Streams
Element Name: Streams and Waterways
Location: Below bridge

Units	Excellent	Good	Fair	Poor
All	0	100	0	0

Material:
Element Type -
Environment:
Protect. System:

Length:
Width:
Height:
Count: 1
Total Quant.

Comments:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Embankments and Streams
Element Name: Embankments
Location: All four quadrants

Units	Excellent	Good	Fair	Poor
All	0	4	0	0

Material:
Element Type -
Environment:
Protect. System:

Length:
Width:
Height:
Count: 4
Total Quant. 4

Comments:
No concerns.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Approaches
Element Name: Wearing Surface
Location: North and south

Units	Excellent	Good	Fair	Poor
	0	43.2	0	0

Material:
Element Type
Environment:
Protect. System:

Length: 6m
Width: 3.6m
Height:
Count: 2
Total Quant. 43.2

Comments:
Good condtion.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

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

Township of Rideau Lakes
2019 OSIM

West elevation

East elevation

Otter Creek – CRCA Bridge

Township of Rideau Lakes
2019 OSIM

Looking north across structure

Looking south across structure

Otter Creek – CRCA Bridge

Loose railing present northwest corner

Typical soffit detail

Southwest wingwall

Disintegration in southwest wingwall

Southeast wingwall

Northeast wingwall

Township of Rideau Lakes
2019 OSIM

North abutment

South abutment

Otter Creek – CRCA Bridge

Disintegration along the top of the south abutment wall

Steel bearings

Inventory Data

Structure Name:	Otter Lake Bridge		
Road Name:	Cataraqui Trail		
Structure Location:	800m West of Kelly's Road		
Owner(s)	Cataraqui Region Conservation Authority		
Latitude: 44.82823	Longitude: -76.069783	Crossing Type:	Non-Navig. Water
MTO Region:	Eastern	Heritage Designation:	Not Cons.
MTO District:	Kingston	Road Class:	
Structure Type:	I-Beams or Girders	Posted Speed:	AADT:
Total Deck Length:	7.8m	No. of Lanes: 1	% Trucks:
Overall Str. Width:	3.6m	Min. Vertical Clearance:	
Total Deck Area:	25.2sq.m	Special Routes:	
Roadway Width:	3.5m	Transit ☐ Truck ☐ School ☐ Bicycle ☑	
Skew Angle:	0	Detour Length Around Bridge:	
No. Spans:	1	Direction of Structure:	East-West
Span Lengths:	7.8	Fill on Structure:	

Historical Data

Year Built:	Year of Last Major Rehab:
Last OSIM Inspection:	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:	2019-08-16	Weather:	Sunny
Inspector:	John Landry, EIT	Temperature:	24
Others in Party:	Lizzie Lindensmith		
Equipment Used:	Camera, Handtools		

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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
	Total Cost:	$0.00

Investigation Notes:

Overall Structure Notes

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

BCI: 68.01

Overall Comments: Date of next inspection: 2021-08-16

Wearing surface has started to deteriorate and should be replaced within the next 5 years. Railing does not meet CHBDC railing requirements and should be updated as maintnenace.

Element Data

Element Group: Decks
Element Name: Wearing Surface
Location: Top of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	22.08	4	2

Material: Wood
Element Type -
Environment: Severe
Protect. System:

Length: 7.8m
Width: 3.6m
Height:
Count: 1
Total Quant. 28.08

Comments:
Severe decay in a number of boards. Patches have been placed over some boards. Spot replace Deck boards as maintenance.

Rehab Recommendations:
Replace wearing surface

Limited Inspection ☐
Performance Def:
Maintenance: Repair of Bridge Timber
Timing: 1-5 Years

Element Data

Element Group: Decks
Element Name: Deck Top - Thin Slab
Location:

Units	Excellent	Good	Fair	Poor
Sq.m	0	28.08	0	0

Material: Wood
Element Type Wood Planks
Environment: Moderate
Protect. System:

Length: 7.8m
Width: 3.6m
Height:
Count: 1
Total Quant. 28.08

Comments:
Timber rail ties. Assumed to be in good condition.

Rehab Recommendations:

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Decks
Element Name: Soffit - Thin Slab
Location: Underside of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	28.08	0	0

Material: Wood
Element Type -
Environment: Benign
Protect. System:

Length: 7.8m
Width: 3.6m
Height:
Count: 1
Total Quant. 28.08

Comments:
Good condition.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Barriers
Element Name: Railing Systems
Location: North and south

Units	Excellent	Good	Fair	Poor
m	0	15.6	0	0

Material: Wood
Element Type: Wood Rail >83mm thick on Wood Post
Environment: Severe
Protect. System:

Length: 7.8m
Width:
Height: 1.05m
Count: 2
Total Quant. 15.6

Comments:
Moderate checks in posts. Railing is loose in northwest. Railing system does not meet railing spacing requirements of CHBDC. Recommend adding railings to meet Railing is loose in northwest.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance: Bridge Handrail Maintenance
Timing:

Element Data

Element Group: Beams
Element Name: Girders
Location: Underside of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	85.18	0	0

Material: Steel
Element Type: Rectangular-Solid
Environment: Benign
Protect. System:

Length: 7.8m
Width: 0.15m
Height: 0.61m
Count: 6
Total Quant. 85.18

Comments:
Minor corrosion throughout.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Beams
Element Name: Diaphragms
Location: Between girders

Units	Excellent	Good	Fair	Poor
Sq.m	0	25	0	0

Material: Steel
Element Type: Rectangular-Solid
Environment: Benign
Protect. System:

Length:
Width:
Height:
Count: 25
Total Quant. 25

Comments:
Light corrosion.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Abutment Walls
Location: North and south

Units	Excellent	Good	Fair	Poor
Sq.m	0	13.32	6	5

Material: Cast-in-place Concrete
Element Type Conventional Closed
Environment: Moderate
Protect. System:

Length:
Width: 3.8m
Height: 3.2m
Count: 2
Total Quant. 24.32

Comments:
Efflorescence and pattern cracking. Light scaling throughout. Localized patches of delamination and moderate to severe erosion at waterline.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Abutments
Element Name: Ballast Walls
Location: On abutment walls

Units	Excellent	Good	Fair	Poor
Sq.m	0	7.6	0	0

Material: Cast-in-place Concrete
Element Type -
Environment: Moderate
Protect. System:

Length:
Width: 3.8m
Height: 1m
Count: 2
Total Quant. 7.6

Comments:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Abutments
Element Name: Wingwalls
Location: All four quadrants

Units	Excellent	Good	Fair	Poor
Sq.m	0	28.28	4.8	2.2

Material: Cast-in-place Concrete
Element Type Reinforced Concrete
Environment: Moderate
Protect. System:

Length: 4.2m
Width:
Height: 4.2m
Count: 4
Total Quant. 35.28

Comments:
Scaling, disintegrationa and narrow cracks with efflorescence. Scour is occuring at waterline. Water is flowing through cold joints causing them to widen.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Abutments
Element Name: Bearings
Location: on abutment walls

Units	Excellent	Good	Fair	Poor
Each	0	12	0	0

Material: Steel
Element Type Plate
Environment: Moderate
Protect. System:

Length:
Width:
Height:
Count: 12
Total Quant. 12

Comments:
Assumed to be in good condition.

Rehab Recommendations:

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Embankments and Streams
Element Name: Streams and Waterways
Location: Below bridge

Units	Excellent	Good	Fair	Poor
All	0	100	0	0

Material:
Element Type -
Environment:
Protect. System:

Length:
Width:
Height:
Count: 1
Total Quant. 1

Comments:

Rehab Recommendations:
downed trees in channel

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Embankments and Streams
Element Name: Embankments
Location: All four quadrants

Units	Excellent	Good	Fair	Poor
All	0	4	0	0

Material:
Element Type -
Environment:
Protect. System:

Length:
Width:
Height:
Count: 4
Total Quant. 4

Comments:
Heavy presence of poison ivy

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Recommended Work by Element

Element Name	Recommended work	Timing	Estimated Cost
Wearing Surface	Replace wearing surface	1-5 Years	$20,000.00

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 $20,000.00

Township of Rideau Lakes
2019 OSIM

West elevation

East elevation

Otter Lake – CRCA Bridge

Township of Rideau Lakes
2019 OSIM

Looking south across structure

Looking north across structure

Otter Lake – CRCA Bridge

Wearing surface on structure (typical)

Decay in wearing surface

Railing system (typical)

Checks present in railing post

Northwest wingwall

Southwest wingwall

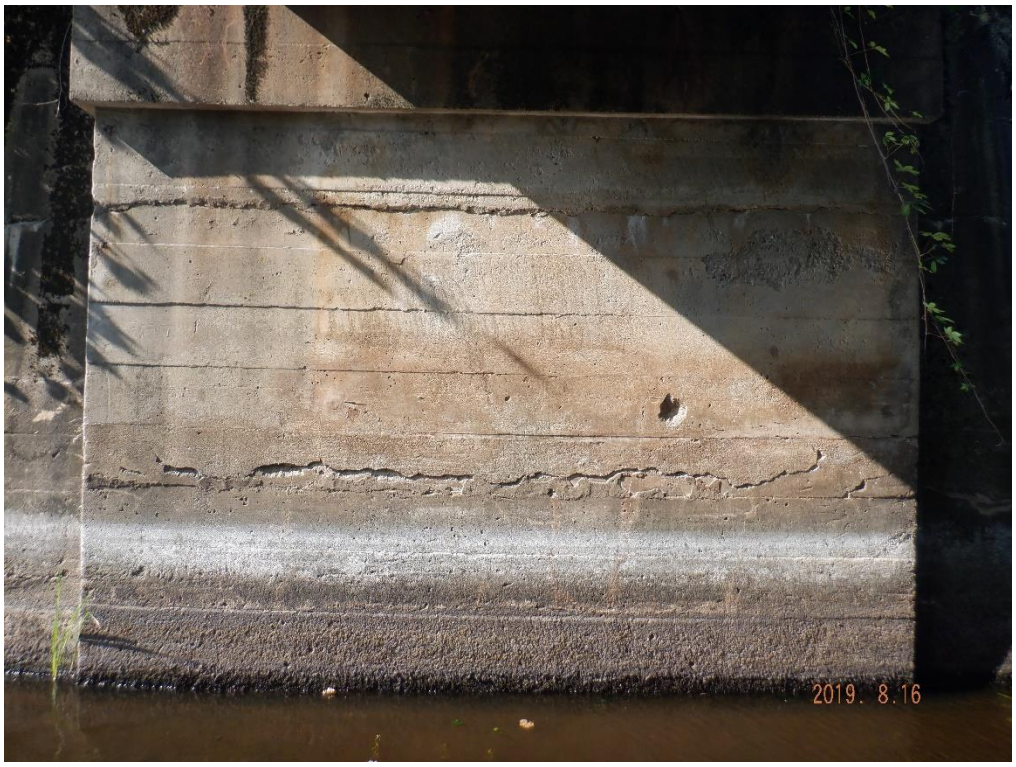
Northeast wingwall

Southeast wingwall

Efflorescence in southwest wingwall

North abutment wall

Erosion present in base of north abutment wall



South abutment wall

Delamination in south abutment wall

Soffit (typical)

Efflorescence in southwest wingwall

Downed tree and debris downstream

Downed tree and debris upstream

Inventory Data

Structure Name: West of Highway 15
Road Name: Cataraqui Trail
Structure Location: 500m West of Highway 15
Owner(s) Cataraqui Region Conservation Authority

Latitude: 44.620808 Longitude: -76.250053 Crossing Type: Non-Navig. Water
MTO Region: Eastern Heritage Designation: Not Cons.
MTO District: Kingston Road Class:
Structure Type: I-Beams or Girders Posted Speed: AADT:
Total Deck Length: 29.4m No. of Lanes: 1 % Trucks:
Overall Str. Width: 3.6m Min. Vertical Clearance:
Total Deck Area: 105.84sq.m Special Routes:
Roadway Width: 3.8m Transit ☐ Truck ☐ School ☐ Bicycle ☑
Skew Angle: 0 Detour Length Around Bridge:
No. Spans: 8 Direction of Structure: East-West
Span Lengths: 3.5 Each Fill on Structure:

Historical Data

Year Built: Year of Last Major Rehab:
Last OSIM Inspection: 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: 2019-08-16 Weather: Sunny
Inspector: John Landry, EIT Temperature: 24
Others in Party: Lizzie Lindensmith
Equipment Used: Camera, Handtools

JEWELL ENGINEERING

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
	Total Cost:	$0.00

Investigation Notes:

Overall Structure Notes

Recommended Work on Structure: Timing

BCI: 72.98

Overall Comments: Date of next inspection: 2021-08-16

Structure is generally in good condition. Recommend improving railing to meet CHBDC standard as maintenance.

Element Data

Element Group: Decks
Element Name: Wearing Surface
Location: Top of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	105.24	0.5	0.1

Material: Wood
Element Type -
Environment: Severe
Protect. System:

Length: 29.4m
Width: 3.6m
Height:
Count: 1
Total Quant. 105.84

Comments:
Generally in good condition. Minor gouges

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Decks
Element Name: Deck Top - Thin Slab
Location: Top of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	105.85	0	0

Material: Wood
Element Type Wood Planks
Environment: Moderate
Protect. System:

Length: 29.4m
Width: 3.6m
Height:
Count: 1
Total Quant. 105.84

Comments:
Assumed to be in good condition based on wearing surface.

Rehab Recommendations:

Limited Inspection ☑
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Decks
Element Name: Soffit - Thin Slab
Location: Underside of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	105.84	0	0

Material: Wood
Element Type -
Environment: Moderate
Protect. System:

Length: 29.4m
Width: 3.6m
Height:
Count: 1
Total Quant. 105.84

Comments:
Good condition.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Barriers
Element Name: Railing Systems
Location: North and south

Units	Excellent	Good	Fair	Poor
m	0	58.8	0	0

Material: Wood
Element Type: Wood Rail >83mm thick on Wood Post
Environment: Severe
Protect. System:

Length: 29.4m
Width:
Height: 1.05m
Count: 2
Total Quant. 58.8

Comments:
Railing system does not meet railing spacing requirements of CHBDC. Recommend adding railings to meet code as maintenance.

Rehab Recommendations:

Limited Inspection ☐
Performance Def: Pedestrian/Vehicular Hazard
Maintenance: Bridge Handrail Maintenance
Timing:

Element Data

Element Group: Beams
Element Name: Girders
Location: Underside of deck

Units	Excellent	Good	Fair	Poor
Sq.m	0	110.1	6	1.5

Material: Wood
Element Type: Rectangular-Solid
Environment: Benign
Protect. System:

Length: 3.5m
Width: 0.25m
Height: 0.45m
Count: 24
Total Quant. 117.6

Comments:
Moderate to severe checking and moderate rot in exterior girders.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Abutments
Element Name: Abutment Walls
Location: East and west

Units	Excellent	Good	Fair	Poor
Sq.m	0	7.2	0	0

Material: Wood
Element Type: Crib or Gabion
Environment: Moderate
Protect. System:

Length:
Width: 3.6m
Height: 1m
Count: 2
Total Quant. 7.2

Comments:
Good condition.

Rehab Recommendations:

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Element Data

Element Group: Piers
Element Name: Shafts/ Columns/ Pile Bents
Location:

Units	Excellent	Good	Fair	Poor
Sq.m	0	26.4	6.6	0

Material: Wood
Element Type Timber Piles with Capping Beam
Environment: Moderate
Protect. System:

Length: 0.3m
Width: 0.3m
Height: 1m
Count: 35
Total Quant. 33

Comments:
Rot noted in the tops of 1/5 of timber piles.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Piers
Element Name: Caps
Location: On pile bents

Units	Excellent	Good	Fair	Poor
Sq.m	0	38.22	0	0

Material: Wood
Element Type -
Environment: Moderate
Protect. System:

Length: 4.2m
Width: 0.3m
Height: 0.35m
Count: 7
Total Quant. 38.22

Comments:
Generally in good condition.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Embankments and Streams
Element Name: Streams and Waterways
Location: Below bridge

Units	Excellent	Good	Fair	Poor
All	0	100	0	0

Material:
Element Type -
Environment:
Protect. System:

Length:
Width:
Height:
Count: 1
Total Quant. 1

Comments:
Channel stagnant at time of inspection.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Embankments and Streams
Element Name: Embankments
Location: All four quadrants

Units	Excellent	Good	Fair	Poor
All	0	4	0	0

Material:
Element Type -
Environment:
Protect. System:

Length:
Width:
Height:
Count: 4
Total Quant. 4

Comments:
No concerns.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Embankments and Streams
Element Name: Slope Protection
Location: All four quadrants

Units	Excellent	Good	Fair	Poor
Each	0	4	0	0

Material: Steel
Element Type Gabions
Environment: Moderate
Protect. System:

Length:
Width:
Height:
Count: 4
Total Quant. 4

Comments:
Good condition.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

Element Data

Element Group: Approaches
Element Name: Wearing Surface
Location: East and west

Units	Excellent	Good	Fair	Poor
Sq.m	0	41	1	0

Material: Gravel
Element Type -
Environment: Severe
Protect. System:

Length: 6m
Width: 3.5m
Height:
Count: 2
Total Quant. 42

Comments:
Minor erosion at deck ends.

Limited Inspection ☐
Performance Def:
Maintenance:
Timing:

Rehab Recommendations:

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

Township of Rideau Lakes
2019 OSIM

South elevation

North elevation

West of Highway 15 – CRCA Bridge

Township of Rideau Lakes
2019 OSIM

Looking west over structure

Looking east over structure

West of Highway 15 – CRCA Bridge

Wearing surface (typical)

Damage present in wearing surface

Railing system (typical)

East abutment

West abutment

Soffit (typical) from east side of structure

Timber pier and pier caps on east side of structure

Rot present in timber pier

Timber piers and pier caps on west side of structure

Rot in girder end over pier