

Ontario Structure Inspection Manual (OSIM)
Bridge Inspection Report
Township of South Frontenac

Prepared by:
D. M. Wills Associates Limited

For:
Cataraqui Conservation

Dated November 21, 2019



WILLS

PARTNERS IN
ENGINEERING

November 21, 2019

Cataraqui Region Conservation Authority
1641 Perth Road, P.O. Box 160
Glenburnie, ON
K0H 1S0

<u>C.R.C.A</u>
Date Rec'd <u>Nov 25/19</u>
Original to: <u>Tom</u>
Other: _____
File #: _____

Attention: Mr. Tom Beaubiah - Manager, Conservations Lands

Dear Tom:

**Re: 2019 OSIM Bridge Inspection Report
D.M. Wills Associates Project No. 16-9206**

Find attached the completed OSIM Bridges Inspection Reports for the following bridge structures owned and maintained by CRCA (all bridges are located on the Cataraqui Trail within the Township of South Frontenac):

- CRCA1 Harrowsmith Road Overpass
- CRCA2 1st Boyce Island Bridge
- CRCA3 2nd Boyce Island Bridge

D.M. Wills Associates Limited ("Wills") was retained to complete detailed visual inspections of the above noted bridges in accordance with the Public Transportation and Improvement Act. Specifically, Ontario Regulation 104/97 'Standards for Bridges' made under the Act requires that:

"The structural integrity, safety and condition of every bridge shall be determined through the performance of at least one inspection in every second calendar year under the direction of a professional engineer and in accordance with the Ontario Structure Inspection Manual ..."

Routine Bridge Maintenance Requirements

CRCA should clean all bridge decks and components on an annual basis preferably each spring after the winter season.



Professional
Engineers
Ontario



Consulting
Engineers of
Ontario



ASSOCIATION OF
CONSULTING ENGINEERING
COMPANIES | CANADA

D.M. Wills Associates Limited
150 Jameson Drive, Peterborough, Ontario, Canada K9J 0B9
P. 705.742.2297 F. 705.748.9944 E. wills@dmwills.com



Mr. Tom Beaubiah
 Page 2 of 2
 November 21, 2019

Capital Budget - Bridge Needs (\$2019)

Each of the CRCA Bridges require some form of repair or rehabilitation over the next five years. We would recommend that this work be budgeted and completed as follows (more details of the work can be found in the OSIM Reports):

<u>Timing</u>	<u>Structure</u>	<u>Budget</u>	<u>Description of Work</u>
Urgent (2020)	CRCA2 / CRCA3	\$26,000	Install barrier along deck edge.
2021	CRCA1 / CRCA2 / CRCA3	\$161,500	Various repairs to concrete, bearings and deck timbers.

Closure

D.M. Wills Associates Ltd. completed the CRCA 2019 OSIM Bridge Inspection program under the supervision of David Bonsall, P.Eng.

The recommended Capital Budget – Bridge Needs must be completed to ensure that the CRCA maintains a safe and minimum maintenance standard for all structures.

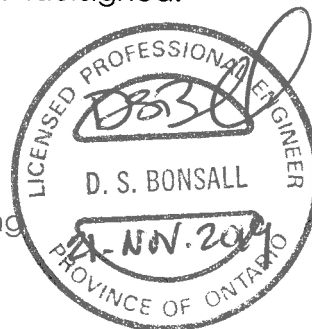
The contents of this letter shall be read in conjunction with the detailed OSIM Inspection Report for each structure. This letter is intended to be a summary of the individual OSIM Reports; however, the detailed (individual) OSIM Reports must be consulted to verify the accuracy of any information contained within.

All reports are based upon the visual condition observed on the date of inspection.

Should you require anything further or clarification of the material provided, please contact the undersigned.

Thank you,

David Bonsall, P.Eng.
 Manager, Structural Engineering



Inventory Data

Structure Name	2nd Boyce Island Bridge		
Main Hwy/Road #	On <input checked="" type="checkbox"/>	Under <input type="checkbox"/>	Crossing Type <u>Ped</u>
Road Name	Cataraqui Trail		
Structure Location	1.0km East of Sills Bay Road		
Latitude	<u>44.42775</u>	Longitude	<u>-76.55490</u>
Owner(s)	Cataraqui Region CA		
Heritage Designation	Cons/not App		
Road Class:	Local		
MTO Region	Eastern		
MTO District	Kingston		
Old County	Frontenac		
Geographic Twp	Loughborough		
Structure Type	Girders (steel)		
Total Deck Length	<u>14.8</u> (m)	Posted Speed	No of Lanes <u>1</u>
Overall Str Width	<u>5.7</u> (m)	AADT	% Trucks
Total Deck Area	<u>84.36</u> (sq. m)	Special Routes: Transit <input type="checkbox"/>	Truck <input type="checkbox"/>
Roadway Width	<u>3.3</u> (m)	School <input type="checkbox"/>	Bicycle <input checked="" type="checkbox"/>
Span Lengths	<u>14.2</u> (m)	Detour Length Around Bridge	<u>0</u> (km)
		Fill on Structure	<u>0</u> (m)
		Skew Angle	<u>0</u> (Degrees)
		Direction of Structure	<u>East/West</u>
		No of Spans	<u>1</u>

Historical Data

Year Built:	<u>1958</u>	Last Biennial Inspection:	<u>2017-09-28</u>
Current Load Limit:	<u> </u> (tonnes)	Last BridgeMaster Inspection:	<u> </u>
Load Limit By-Law #:	<u> </u>	Last Evaluation:	<u> </u>
By-Law Expiry Date:	<u> </u>	Last Underwater Inspection:	<u> </u>
Min Vertical Clearance:	<u>0.9</u> (m)	Last Condition Survey:	<u> </u>
Rehab History: (Date/description)			

Municipal Structure Inspection Form

Structure Number: CRCA3

Element Data

Element Group: Signs
 Element Name: Signs
 Location: Four quadrants
 Material:
 Element Type:
 Environment: Benign
 Protection System:

Length:
 Width:
 Height:
 Count: 4
 Total Quantity: 4
 Limited Inspection

Condition Data:	Units	Exc	Good	Fair	Poor
	Sq. m		4		

Comments
 Four hazard signs

Recommended Work

Maint. Needs

Perform. Deficiencies

Estimated Construction Cost: \$0.00

Priority: None
 6-10 yrs
 1-5 yrs
 Within 1 yr
 Urgent

Element Group: Decks
 Element Name: Railing Systems
 Location: Both sides
 Material:
 Element Type:
 Environment: Benign
 Protection System:

Length: 15
 Width:
 Height:
 Count: 2
 Total Quantity: 30
 Limited Inspection

Condition Data:	Units	Exc	Good	Fair	Poor
	m				30

Comments

Recommended Work
 Add railing between gap of deck and truss for safety.

Maint. Needs

Perform. Deficiencies

Estimated Construction Cost: \$9,500.00

Priority: None
 6-10 yrs
 1-5 yrs
 Within 1 yr
 Urgent

Element Group: Beams/MLE's
 Element Name: Floor Beams
 Location: Transverse Beams
 Material: Weathering steel
 Element Type: I-type
 Environment: Benign
 Protection System:

Length: 4.9
 Width: 0.34
 Height: 0.65
 Count: 6
 Total Quantity: 68.2
 Limited Inspection

Condition Data:	Units	Exc	Good	Fair	Poor
	Sq. m		68.2		

Comments

Recommended Work

Maint. Needs

Perform. Deficiencies

Estimated Construction Cost: \$0.00

Priority: None
 6-10 yrs
 1-5 yrs
 Within 1 yr
 Urgent

Municipal Structure Inspection Form

Structure Number: CRCA3

<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Element Group:</td><td>Beams/MLE's</td></tr> <tr><td>Element Name:</td><td>Floor Beams</td></tr> <tr><td>Location:</td><td>Plan Cross Bracing</td></tr> <tr><td>Material:</td><td>Weathering steel</td></tr> <tr><td>Element Type:</td><td>Other</td></tr> <tr><td>Environment:</td><td>Benign</td></tr> <tr><td>Protection System:</td><td></td></tr> </table> <p>Condition Data: Units Exc Good Fair Poor</p> <p style="text-align: center;">m <input type="text"/> <input type="text"/> 35.75 <input type="text"/> <input type="text"/></p> <p>Comments Steel Angles</p> <p>Recommended Work</p>	Element Group:	Beams/MLE's	Element Name:	Floor Beams	Location:	Plan Cross Bracing	Material:	Weathering steel	Element Type:	Other	Environment:	Benign	Protection System:		<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Length:</td><td style="text-align: right;">5.5</td></tr> <tr><td>Width:</td><td style="text-align: right;">0.15</td></tr> <tr><td>Height:</td><td style="text-align: right;">0.1</td></tr> <tr><td>Count:</td><td style="text-align: right;">10</td></tr> <tr><td>Total Quantity:</td><td style="text-align: right;">35.75</td></tr> <tr><td>Limited Inspection</td><td><input type="checkbox"/></td></tr> </table> <p>Maint. Needs</p> <p>Perform. Deficiencies</p> <p>Estimated Construction Cost: \$0.00</p> <p style="text-align: right;">Priority</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>None</td></tr> <tr><td>6-10 yrs</td></tr> <tr><td>1-5 yrs</td></tr> <tr><td>Within 1 yr</td></tr> <tr><td>Urgent</td></tr> </table>	Length:	5.5	Width:	0.15	Height:	0.1	Count:	10	Total Quantity:	35.75	Limited Inspection	<input type="checkbox"/>	None	6-10 yrs	1-5 yrs	Within 1 yr	Urgent
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Municipal Structure Inspection Form

Structure Number: **CRCA3**

<p>Element Group: Decks</p> <p>Element Name: Wearing surface</p> <p>Location:</p> <p>Material: Wood</p> <p>Element Type: Wood Planks</p> <p>Environment: Severe</p> <p>Protection System:</p>	<p>Length: 14.8</p> <p>Width: 3.3</p> <p>Height:</p> <p>Count: 1</p> <p>Total Quantity: 48.84</p> <p>Limited Inspection <input type="checkbox"/></p>															
<p>Condition Data:</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Units</th> <th>Exc</th> <th>Good</th> <th>Fair</th> <th>Poor</th> </tr> <tr> <td>Sq. m</td> <td></td> <td>32.56</td> <td></td> <td>16.28</td> </tr> </table>	Units	Exc	Good	Fair	Poor	Sq. m		32.56		16.28	<p>Maint. Needs</p> <p>Perform. Deficiencies</p> <p>Pedestrian/vehicular hazard</p> <p>Estimated Construction Cost: \$6,000.00</p> <p>Priority</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>None</td></tr> <tr><td>6-10 yrs</td></tr> <tr><td>1-5 yrs</td></tr> <tr><td>Within 1 yr</td></tr> <tr><td>Urgent</td></tr> </table>	None	6-10 yrs	1-5 yrs	Within 1 yr	Urgent
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<p>Comments</p> <p>2x6 longitudinal boards. Centre third worn from snowmobiles.</p> <p>Recommended Work</p> <p>Repair wearing surface.</p>																

<p>Element Group: Sidewalks/curbs</p> <p>Element Name: Curbs</p> <p>Location:</p> <p>Material: Wood</p> <p>Element Type: Rectangular-solid</p> <p>Environment: Moderate</p> <p>Protection System: None</p>	<p>Length: 14.8</p> <p>Width: 0.2</p> <p>Height: 0.1</p> <p>Count: 2</p> <p>Total Quantity: 29.6</p> <p>Limited Inspection <input type="checkbox"/></p>															
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<p>Element Group: Beams/ML'E's</p> <p>Element Name: Girders</p> <p>Location: two sides of structure</p> <p>Material: Weathering steel</p> <p>Element Type: I-type</p> <p>Environment: Benign</p> <p>Protection System:</p>	<p>Length: 14.2</p> <p>Width: 0.36</p> <p>Height: 1.6</p> <p>Count: 2</p> <p>Total Quantity: 121.55</p> <p>Limited Inspection <input type="checkbox"/></p>															
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Municipal Structure Inspection Form

Structure Number: CRCA3

<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Element Group:</td><td>Abutments</td></tr> <tr><td>Element Name:</td><td>Wingwalls</td></tr> <tr><td>Location:</td><td>Each quadrant</td></tr> <tr><td>Material:</td><td>Cast-in-place concrete</td></tr> <tr><td>Element Type:</td><td>Reinforced concrete</td></tr> <tr><td>Environment:</td><td>Moderate</td></tr> <tr><td>Protection System:</td><td></td></tr> </table> <p>Condition Data: Units Exc Good Fair Poor</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">Sq. m</td> <td style="width:15%;"></td> <td style="width:15%;"></td> <td style="width:15%; text-align: center;">1.87</td> <td style="width:15%;"></td> <td style="width:15%; text-align: center;">5.61</td> </tr> </table> <p>Comments</p> <p>Recommended Work</p> <p>Repair concrete at Southwest quadrant.</p>	Element Group:	Abutments	Element Name:	Wingwalls	Location:	Each quadrant	Material:	Cast-in-place concrete	Element Type:	Reinforced concrete	Environment:	Moderate	Protection System:		Sq. m			1.87		5.61	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Length:</td><td style="text-align: right;">1.7</td></tr> <tr><td>Width:</td><td></td></tr> <tr><td>Height:</td><td style="text-align: right;">1.1</td></tr> <tr><td>Count:</td><td style="text-align: right;">4</td></tr> <tr><td>Total Quantity:</td><td style="text-align: right;">7.48</td></tr> <tr><td>Limited Inspection</td><td><input type="checkbox"/></td></tr> </table> <p>Maint. Needs</p> <p>Perform. Deficiencies</p> <p>Estimated Construction Cost: \$5,000.00</p> <p style="text-align: right;">Priority</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>None</td></tr> <tr><td>6-10 yrs</td></tr> <tr><td>1-5 yrs</td></tr> <tr><td>Within 1 yr</td></tr> <tr><td>Urgent</td></tr> </table>	Length:	1.7	Width:		Height:	1.1	Count:	4	Total Quantity:	7.48	Limited Inspection	<input type="checkbox"/>	None	6-10 yrs	1-5 yrs	Within 1 yr	Urgent
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Repair and Rehabilitation Required

Element Group	Element Name	Comments Repair/Rehabilitation	Priority (Years)	Estimated Cost
Abutments	Wingwalls	Repair concrete at Southwest quadrant.	1-5 yrs	\$5,000.00
Decks	Wearing surface	Repair wearing surface.	1-5 yrs	\$6,000.00
Abutments	Bearings	Repair concrete in Bearing Seats.	1-5 yrs	\$5,000.00
Abutments	Abutment walls	Repair concrete.	1-5 yrs	\$5,000.00
Decks	Railing Systems	Add railing between gap of deck and truss for safety.	Urgent	\$9,500.00
Total				\$30,500.00

Associated Work

	Comments	Estimated Cost
Approaches	<input type="text"/>	\$0.00
Detours	<input type="text"/>	\$0.00
Traffic Control	<input type="text"/>	\$0.00
Utilities	<input type="text"/>	\$0.00
Right of Way	<input type="text"/>	\$0.00
Environmental Study	<input type="text"/>	\$0.00
Other	Engineering Design & Construction Review	\$3,000.00
Contingencies	Contingency Allowance	\$3,000.00
Total Estimated Const. Cost		\$36,500.00

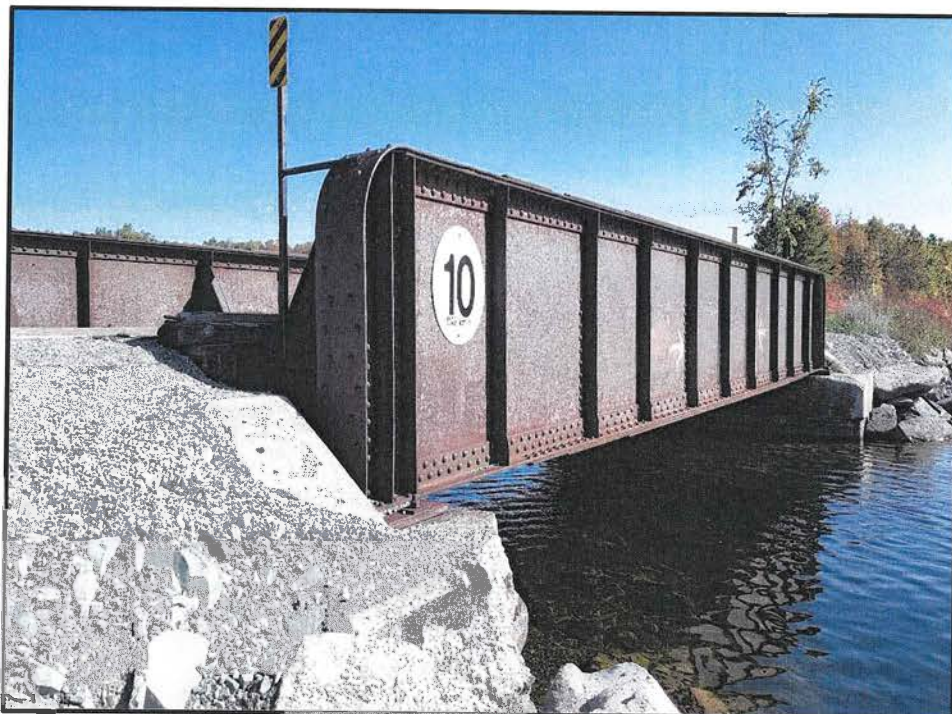
Justification

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA3



Looking East along Trail over Bridge



South Elevation

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA3



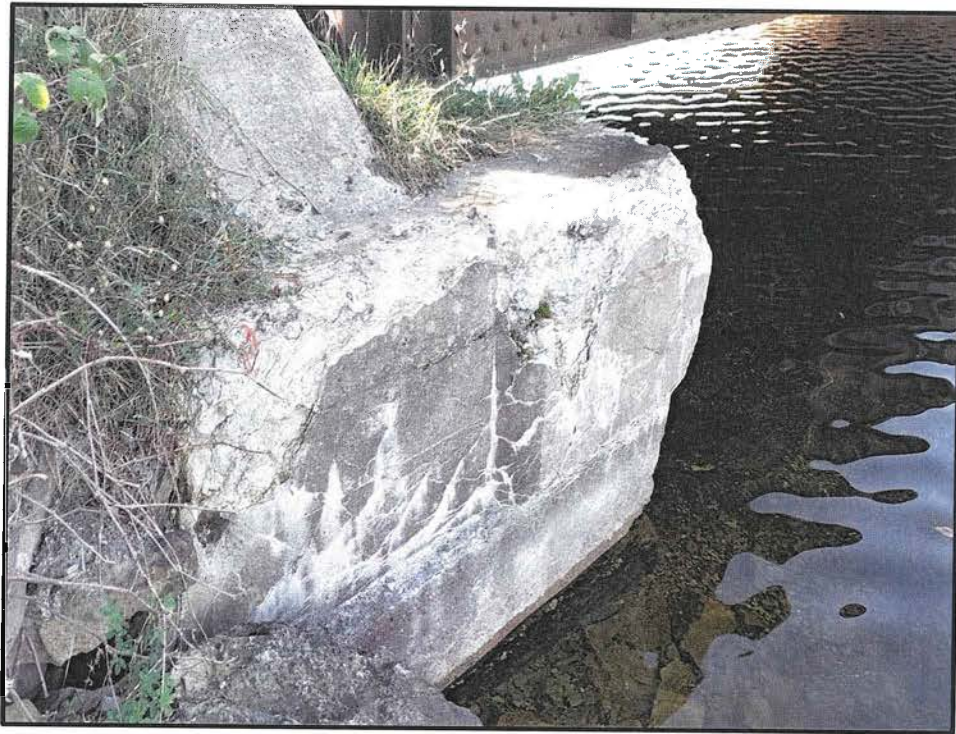
Deck to Truss Gap (To Be Filled or Guarded with Rail)



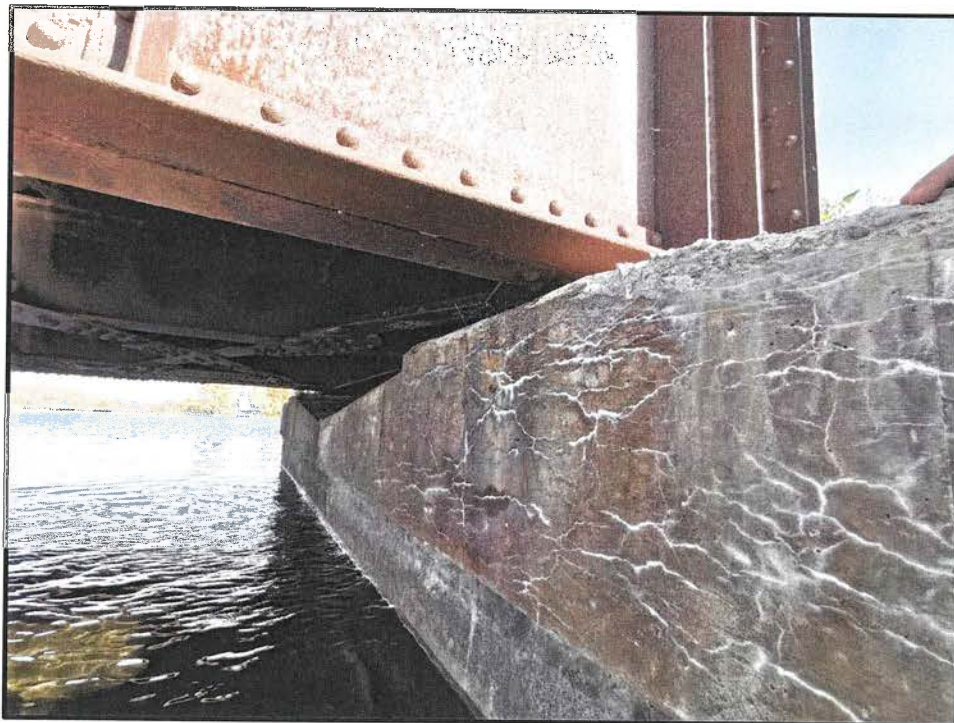
Severe Cracking and Spall at SW Abutment Wall

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA3



Deterioration of Abutment



Map Cracking and Efflorescence of Abutment

Inventory Data

Structure Name	1st Boyce Island Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type <input type="text" value="Ped"/>
Road Name	Cataraqui Trail		
Structure Location	0.5km East of Sills Bay Road		
Latitude	44.426966	Longitude	-76.56075
Owner(s)	Cataraqui Region CA		
Heritage Designation	<input type="text"/>		
Road Class:	<input type="text"/>		
MTO Region	Eastern		
MTO District	Kingston		
Old County	Frontenac		
Geographic Twp	Loughborough		
Structure Type	Girders (steel)		
Total Deck Length	<input type="text" value="28.1"/>	(m)	Posted Speed <input type="text"/>
Overall Str Width	<input type="text" value="5.9"/>	(m)	No of Lanes <input type="text" value="1"/>
Total Deck Area	<input type="text" value="165.79"/>	(sq. m)	AADT <input type="text"/>
Roadway Width	<input type="text" value="3.3"/>	(m)	% Trucks <input type="text"/>
Span Lengths	<input type="text" value="26.7"/>		
			Special Routes: Transit <input type="checkbox"/> Truck <input type="checkbox"/> School <input type="checkbox"/> Bicycle <input checked="" type="checkbox"/>
			Detour Length Around Bridge <input type="text"/> (km)
			Fill on Structure <input type="text" value="0"/> (m)
			Skew Angle <input type="text" value="0"/> (Degrees)
			Direction of Structure <input type="text" value="East/West"/>
			No of Spans <input type="text" value="1"/>

Historical Data

Year Built:	<input type="text" value="1958"/>	Last Biennial Inspection:	<input type="text" value="2017-09-28"/>
Current Load Limit:	<input type="text"/> (tonnes)	Last BridgeMaster Inspection:	<input type="text"/>
Load Limit By-Law #:	<input type="text"/>	Last Evaluation:	<input type="text"/>
By-Law Expiry Date:	<input type="text"/>	Last Underwater Inspection:	<input type="text"/>
Min Vertical Clearance:	<input type="text" value="1.65"/> (m)	Last Condition Survey:	<input type="text"/>
Rehab History: (Date/description)			

Element Data

Element Group:	Signs				Length:		
Element Name:	Signs				Width:		
Location:	each quadrant				Height:		
Material:					Count:	4	
Element Type:					Total Quantity:	4	
Environment:	Benign				Limited Inspection	<input type="checkbox"/>	
Protection System:					Maint. Needs		
Condition Data:	Units	Exc	Good	Fair	Poor		
	Each		4				
Comments	Four hazard signs					Perform. Deficiencies	
Recommended Work						Estimated Construction Cost:	\$0.00
						Priority	None 6-10 yrs 1-5 yrs Within 1 yr Urgent

Element Group:	Barriers				Length:	28	
Element Name:	Railing Systems				Width:		
Location:	Both side				Height:		
Material:					Count:	2	
Element Type:					Total Quantity:	56	
Environment:	Benign				Limited Inspection	<input type="checkbox"/>	
Protection System:					Maint. Needs		
Condition Data:	Units	Exc	Good	Fair	Poor		
	ft				56		
Comments						Perform. Deficiencies	
Recommended Work	Add railing between gap of deck and truss for safety					Estimated Construction Cost:	\$16,500.00
						Priority	None 6-10 yrs 1-5 yrs Within 1 yr Urgent

Element Group:	Decks				Length:	4	
Element Name:	Deck top				Width:	0.25	
Location:					Height:	0.25	
Material:	Wood				Count:	48	
Element Type:	Rectangular-solid				Total Quantity:	144	
Environment:	Benign				Limited Inspection	<input type="checkbox"/>	
Protection System:					Maint. Needs		
Condition Data:	Units	Exc	Good	Fair	Poor		
	Sq. m		144				
Comments	Transverse Timber Beams					Perform. Deficiencies	
Recommended Work						Estimated Construction Cost:	\$0.00
						Priority	None 6-10 yrs 1-5 yrs Within 1 yr Urgent

Municipal Structure Inspection Form

Structure Number: **CRCA2**

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Municipal Structure Inspection Form

Structure Number: **CRCA2**

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Municipal Structure Inspection Form

Structure Number: CRCA2

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Municipal Structure Inspection Form

Structure Number: **CRCA2**

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Element Group:	Decks																								
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Municipal Structure Inspection Form

Structure Number: **CRCA2**

Element Group:	Sidewalks/curbs				Length:	28.1	
Element Name:	Curbs				Width:	0.2	
Location:					Height:	0.1	
Material:	Wood				Count:	2	
Element Type:					Total Quantity:	56.2	
Environment:	Moderate				Limited Inspection	<input type="checkbox"/>	
Protection System:					Maint. Needs		
Condition Data:	Units	Exc	Good	Fair	Poor	Perform. Deficiencies	
	m			51.2	5		
Comments	Exposed bolt and section loss at North-East corner.					Estimated Construction Cost:	\$500.00
Recommended Work	Replace 5m section of NE corner.					Priority	None 6-10 yrs 1-5 yrs Within 1 yr Urgent

Repair and Rehabilitation Required				
Element Group	Element Name	Comments Repair/Rehabilitation	Priority (Years)	Estimated Cost
Sidewalks/curbs	Curbs	Replace 5m section of NE corner.	1-5 yrs	\$500.00
Decks	Wearing surface	Repair four corners of deck	1-5 yrs	\$6,000.00
Abutments	Bearings	Reset bearing at Southwest	1-5 yrs	\$6,000.00
Abutments	Ballast walls	Repair concrete.	1-5 yrs	\$6,000.00
Abutments	Abutment walls	Reface abutment wall.	1-5 yrs	\$16,500.00
Abutments	Abutment walls	Repair concrete	1-5 yrs	\$6,000.00
Barriers	Railing Systems	Add railing between gap of deck and truss for safety	Urgent	\$16,500.00
Total				\$57,500.00

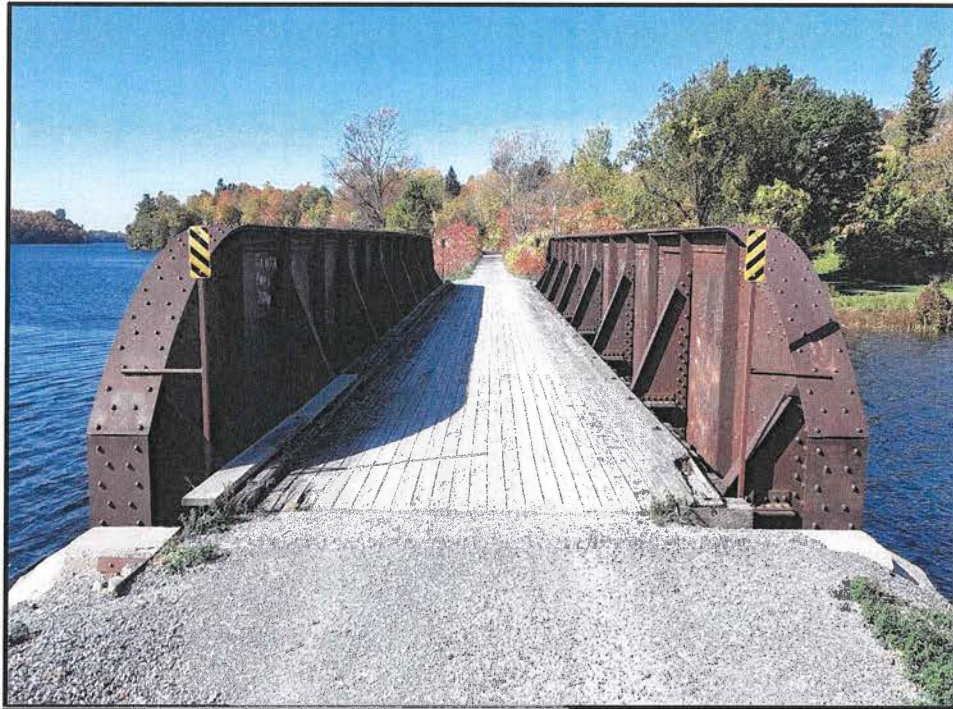
Associated Work

	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	Engineering Design & Construction Review	\$7,500.00
Contingencies	Contingency Allowance	\$10,000.00
Total Estimated Const. Cost		\$75,000.00

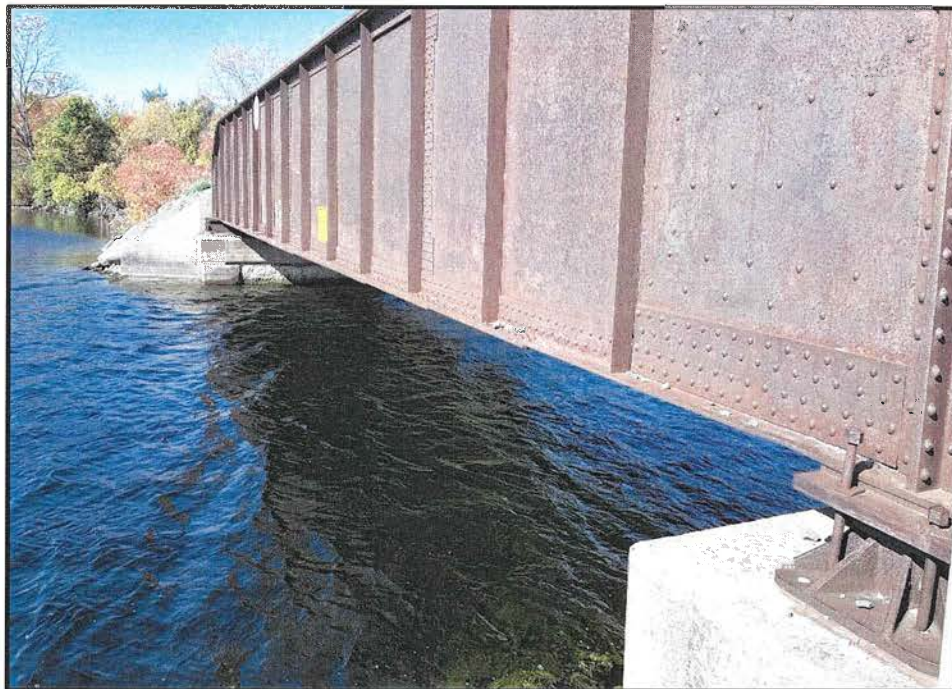
Justification

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA2



Looking West along Trail over Bridge



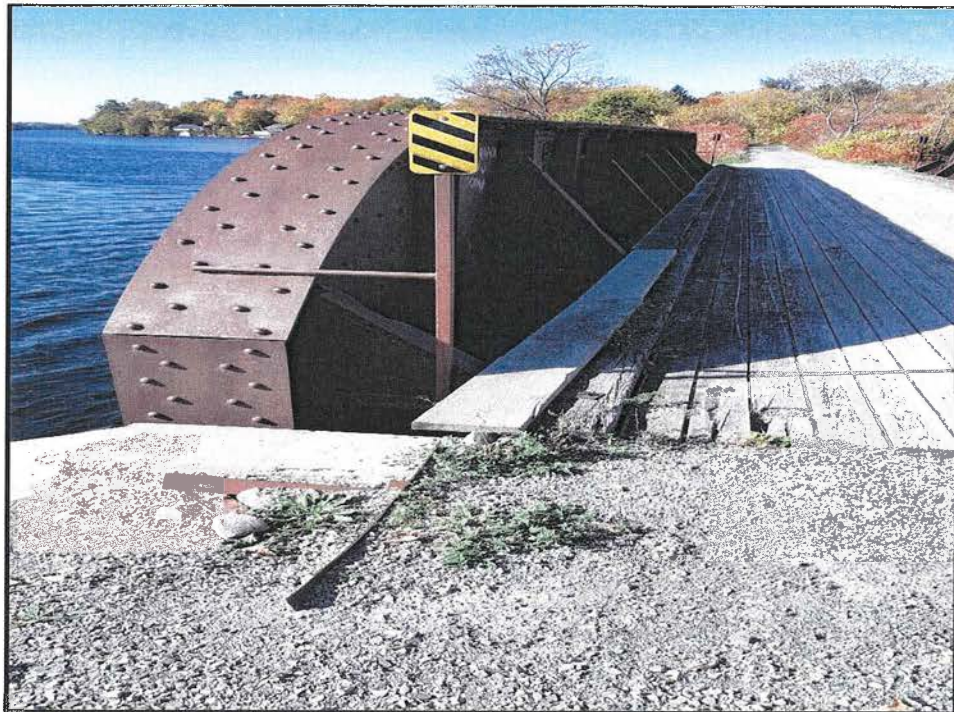
South Elevation

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA2



Damaged NE Corner of Timber Curb



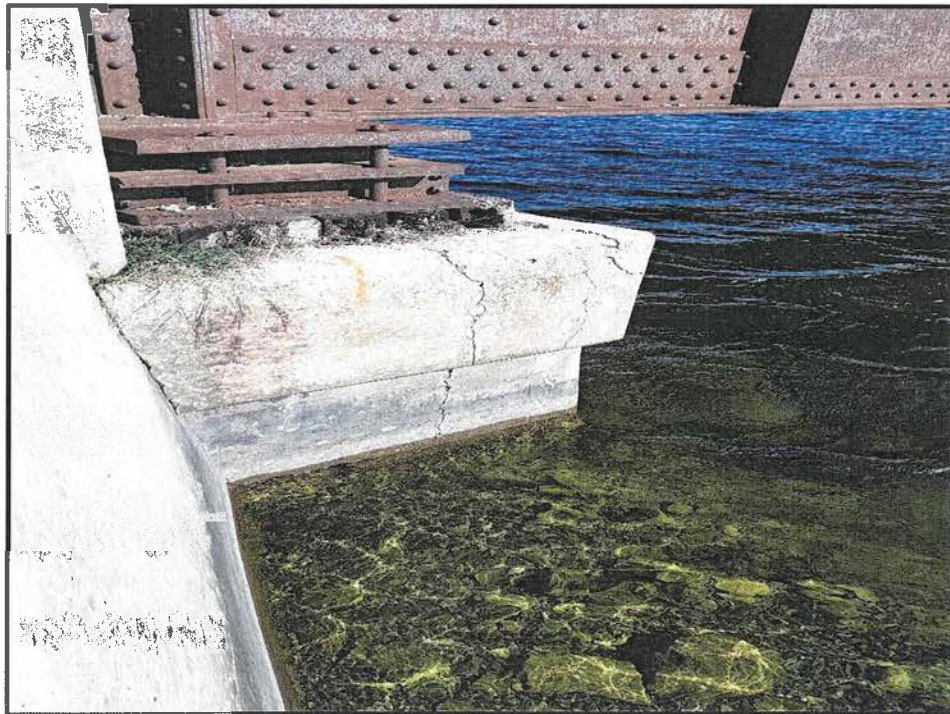
Deteriorating Wood of SE Deck Corner

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA2



Worn Deck Top



SW Bearing in Poor Condition

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA2



Severe Cracking on SW Bearing Seat



Abutment Wall

Inventory Data

Structure Name	Harrowsmith Road Overpass		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type <input type="text" value="Ped"/>
Road Name	Catarauqui Trail over Harrowsmith Road		
Structure Location	0.4km East of Wilson Road		
Latitude	<input type="text" value="44.405483"/>	Longitude	<input type="text" value="-76.63543"/>
Owner(s)	<input type="text" value="Catarauqui Region CA"/>		
Heritage Designation	<input type="text"/>		
Road Class:	<input type="text"/>		
MTO Region	<input type="text" value="Eastern"/>		
MTO District	<input type="text" value="Kingston"/>		
Old County	<input type="text" value="Frontenac"/>		
Geographic Twp	<input type="text" value="Portland"/>		
Structure Type	<input type="text" value="I-beam or Girders"/>		
Total Deck Length	<input type="text" value="35.2"/>	(m)	Posted Speed <input type="text"/>
Overall Str Width	<input type="text" value="5.3"/>	(m)	No of Lanes <input type="text" value="1"/>
Total Deck Area	<input type="text" value="186.56"/>	(sq. m)	AADT <input type="text"/>
Roadway Width	<input type="text" value="3.9"/>	(m)	% Trucks <input type="text"/>
Span Lengths	<input type="text" value="30"/>		
			Special Routes: Transit <input type="checkbox"/> Truck <input type="checkbox"/> School <input type="checkbox"/> Bicycle <input checked="" type="checkbox"/>
			Detour Length Around Bridge <input type="text"/> (km)
			Fill on Structure <input type="text" value="0.3"/> (m)
			Skew Angle <input type="text" value="45"/> (Degrees)
			Direction of Structure <input type="text" value="North/South"/>
			No of Spans <input type="text" value="1"/>

Historical Data

Year Built:	<input type="text" value="1965"/>	Last Biennial Inspection:	<input type="text" value="2017-09-28"/>
Current Load Limit:	<input type="text"/> (tonnes)	Last BridgeMaster Inspection:	<input type="text"/>
Load Limit By-Law #:	<input type="text"/>	Last Evaluation:	<input type="text"/>
By-Law Expiry Date:	<input type="text"/>	Last Underwater Inspection:	<input type="text"/>
Min Vertical Clearance:	<input type="text" value="4.6"/> (m)	Last Condition Survey:	<input type="text"/>
Rehab History: (Date/description)			

Municipal Structure Inspection Form

Structure Number: CRCA1

Element Data

Element Group:	Barriers				Length:	33.3	
Element Name:	Railing Systems				Width:		
Location:	Both sides				Height:	0.95	
Material:	Wood				Count:	2	
Element Type:					Total Quantity:	66.59	
Environment:	Benign				Limited Inspection	<input type="checkbox"/>	
Protection System:	None				Maint. Needs		
Condition Data:	Units	Exc	Good	Fair	Poor	Perform. Deficiencies	
	Sq. m		66.59			Estimated Construction Cost: \$0.00	
Comments	4 2x10 laminated timber for each side.				Priority	None	
Recommended Work						6-10 yrs	
						1-5 yrs	
						Within 1 yr	
						Urgent	

Element Group:	Approaches				Length:		
Element Name:	Railing Systems				Width:	1.5	
Location:	Each Quadrant				Height:		
Material:					Count:	4	
Element Type:					Total Quantity:	4	
Environment:	Benign				Limited Inspection	<input type="checkbox"/>	
Protection System:					Maint. Needs		
Condition Data:	Units	Exc	Good	Fair	Poor	Perform. Deficiencies	
	Each		4			Estimated Construction Cost: \$0.00	
Comments	Chain link fence.				Priority	None	
Recommended Work						6-10 yrs	
						1-5 yrs	
						Within 1 yr	
						Urgent	

Element Group:	Decks				Length:	35.4	
Element Name:	Deck top				Width:	3.9	
Location:					Height:		
Material:	Weathering steel				Count:	1	
Element Type:	Steel Plate - non-composite				Total Quantity:	138.06	
Environment:	Benign				Limited Inspection	<input checked="" type="checkbox"/>	
Protection System:					Maint. Needs		
Condition Data:	Units	Exc	Good	Fair	Poor	Perform. Deficiencies	
	Sq. m		138.1			Estimated Construction Cost:	
Comments	Steel deck covered with approximately 0.3 m of granular material.				Priority	None	
Recommended Work						6-10 yrs	
						1-5 yrs	
						Within 1 yr	
						Urgent	



Municipal Structure Inspection Form

Structure Number: CRCA1

<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Element Group:</td><td>Beams/MLE's</td></tr> <tr><td>Element Name:</td><td>Girders</td></tr> <tr><td>Location:</td><td></td></tr> <tr><td>Material:</td><td>Weathering steel</td></tr> <tr><td>Element Type:</td><td>I-type</td></tr> <tr><td>Environment:</td><td>Benign</td></tr> <tr><td>Protection System:</td><td></td></tr> </table> <p>Condition Data: Units Exc Good Fair Poor</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">Sq. m</td> <td style="width:15%;"></td> <td style="width:15%; text-align: center;">402.86</td> <td style="width:15%;"></td> <td style="width:15%;"></td> </tr> </table> <p>Comments</p> <div style="border: 1px solid black; height: 30px; width: 100%;"></div> <p>Recommended Work</p> <div style="border: 1px solid black; height: 30px; width: 100%;"></div>	Element Group:	Beams/MLE's	Element Name:	Girders	Location:		Material:	Weathering steel	Element Type:	I-type	Environment:	Benign	Protection System:		Sq. m		402.86			<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Length:</td><td style="text-align: right;">30.8</td></tr> <tr><td>Width:</td><td style="text-align: right;">0.46</td></tr> <tr><td>Height:</td><td style="text-align: right;">2.58</td></tr> <tr><td>Count:</td><td style="text-align: right;">2</td></tr> <tr><td>Total Quantity:</td><td style="text-align: right;">402.86</td></tr> </table> <p>Limited Inspection <input type="checkbox"/></p> <p>Maint. Needs</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p>Perform. Deficiencies</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p>Estimated Construction Cost: \$0.00</p> <p style="text-align: right;">Priority</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td style="background-color: #cccccc;">None</td></tr> <tr><td>6-10 yrs</td></tr> <tr><td>1-5 yrs</td></tr> <tr><td>Within 1 yr</td></tr> <tr><td>Urgent</td></tr> </table>	Length:	30.8	Width:	0.46	Height:	2.58	Count:	2	Total Quantity:	402.86	None	6-10 yrs	1-5 yrs	Within 1 yr	Urgent
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Municipal Structure Inspection Form

Structure Number: **CRCA1**

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<p>Comments</p> <p>Some efflorescence visible near the top of the north abutment wall. Severe delamination of south and north abutment walls. (S - 45 Sq.m, N - 6 Sq.m)</p> <p>Recommended Work</p> <p>Chip and Patch delaminated concrete on abutment faces.</p>																													

Municipal Structure Inspection Form

Structure Number: **CRCA1**

<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Element Group:</td><td>Abutments</td></tr> <tr><td>Element Name:</td><td>Ballast walls</td></tr> <tr><td>Location:</td><td>Each side</td></tr> <tr><td>Material:</td><td>Cast-in-place concrete</td></tr> <tr><td>Element Type:</td><td></td></tr> <tr><td>Environment:</td><td>Benign</td></tr> <tr><td>Protection System:</td><td>None</td></tr> </table>	Element Group:	Abutments	Element Name:	Ballast walls	Location:	Each side	Material:	Cast-in-place concrete	Element Type:		Environment:	Benign	Protection System:	None	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Length:</td><td>0.46</td></tr> <tr><td>Width:</td><td>17.5</td></tr> <tr><td>Height:</td><td>1.2</td></tr> <tr><td>Count:</td><td>2</td></tr> <tr><td>Total Quantity:</td><td>42</td></tr> <tr><td>Limited Inspection</td><td><input type="checkbox"/></td></tr> </table>	Length:	0.46	Width:	17.5	Height:	1.2	Count:	2	Total Quantity:	42	Limited Inspection	<input type="checkbox"/>		
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Municipal Structure Inspection Form

Structure Number: **CRCA1**

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Repair and Rehabilitation Required				
Element Group	Element Name	Comments Repair/Rehabilitation	Priority (Years)	Estimated Cost
Abutments	Wingwalls	Underpin and repair concrete.	1-5 yrs	\$6,000.00
Abutments	Abutment walls	Chip and Patch delaminated concrete on abutment faces.	1-5 yrs	\$50,000.00
Total				\$56,000.00

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	Engineering Allowance	\$10,000.00
Contingencies	Contingency Allowance	\$10,000.00
Total Estimated Const. Cost		\$76,000.00

Justification

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA1



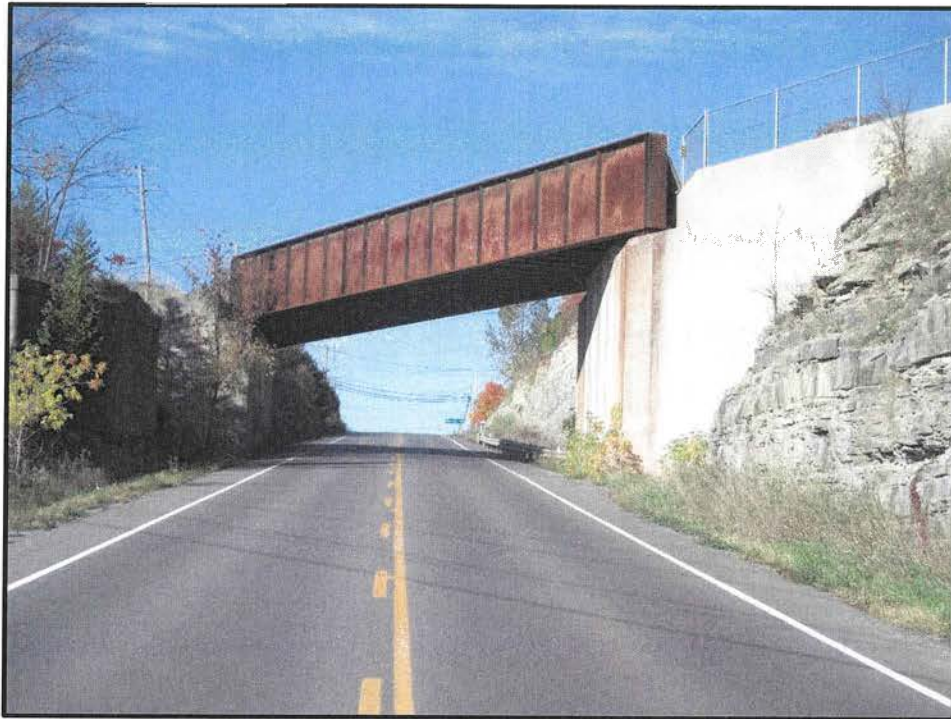
Looking South along Trail



Looking North along Trail

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA1



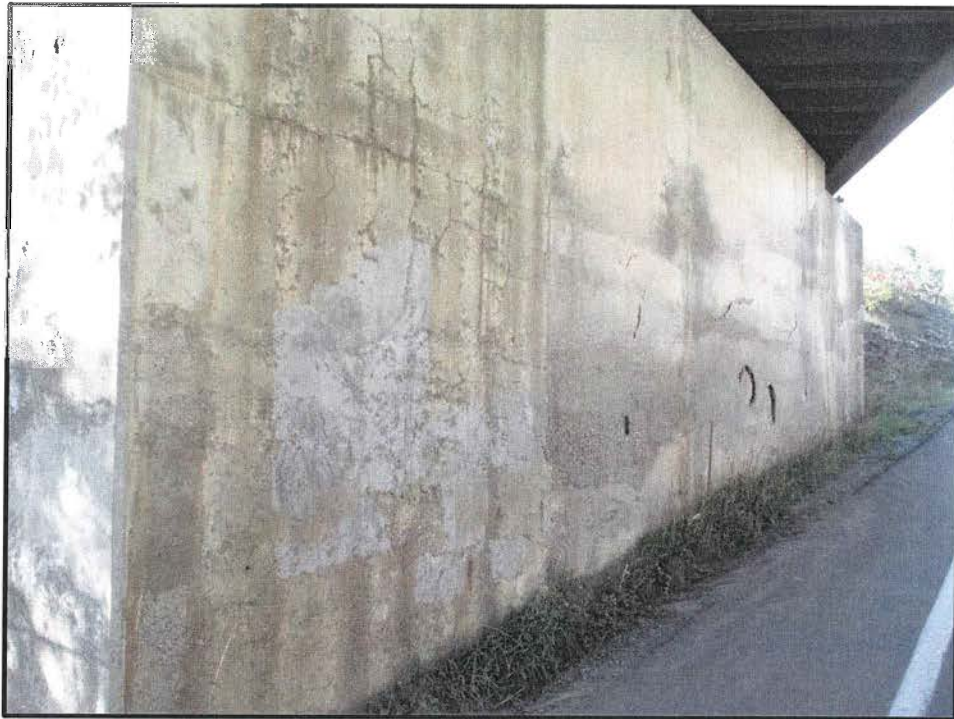
East Elevation



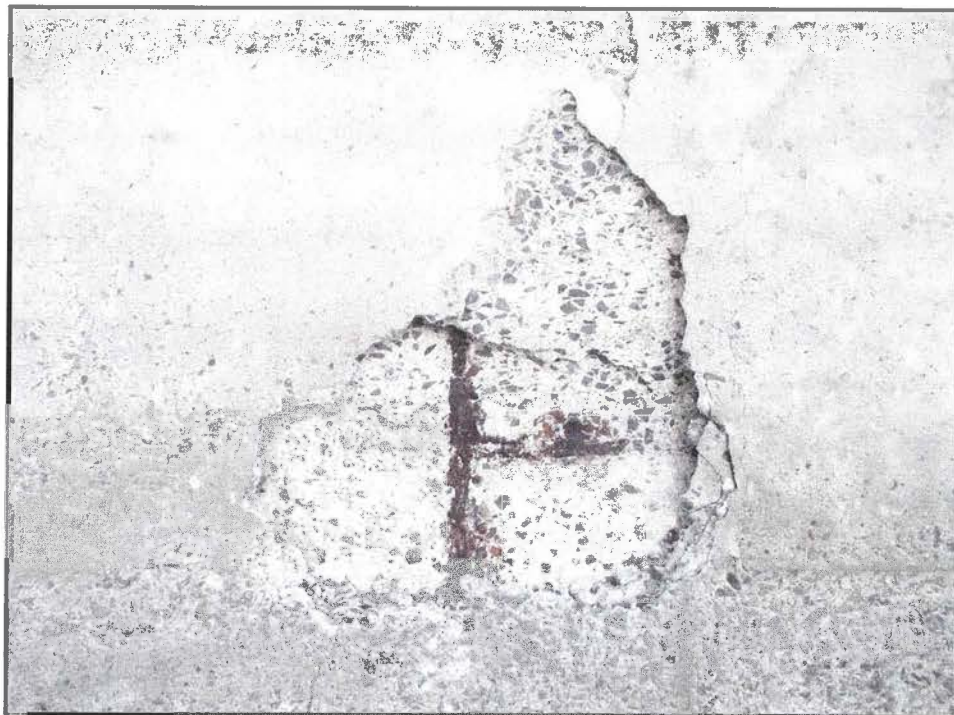
Scaling on Expose Top Section of NE Wingwall

SITE PHOTOGRAPHS

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South Abutment Wall



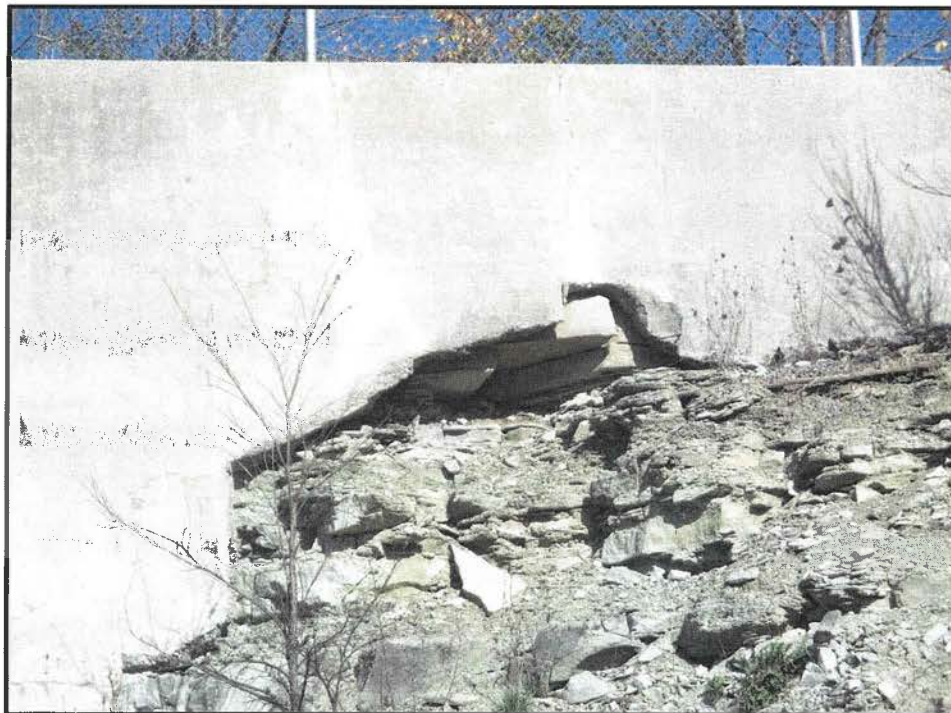
Severe Delamination on South Abutment Wall

SITE PHOTOGRAPHS

STRUCTURE NUMBER: CRCA1



NW Wingwall



Section of NE Wingwall Undermining

SITE PHOTOGRAPHS

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Floor Beams