

**LONG POINT CAUSEWAY BRIDGE**

Site Number 985901

**COUNTY HIGHWAY 59, SOUTH WALSINGHAM**

1.4 km S of County Road 42

**Ontario Structure Inspection Manual - Inspection Form**
**Site Number:** 985901

**Inventory Data:**

Structure Name	Long Point Causeway Bridge		
Main Hwy/Road #	NORFOLK COUNTY HWY 59	<input checked="" type="checkbox"/> On <input type="checkbox"/> Under	Crossing Type: <input type="checkbox"/> Rail <input type="checkbox"/> Road <input type="checkbox"/> Navig. Water <input type="checkbox"/> Ped. <input type="checkbox"/> Other <input checked="" type="checkbox"/> Non-Navig. Water
Hwy/Road Name	COUNTY HIGHWAY 59, SOUTH WALSINGHAM		
Structure Location	1.4 km S of County Road 42		
Latitude	42d 36' 02" N	Longitude	80d 27' 16.5" W
Owner(s)	Norfolk County	Heritage Designation:	<input checked="" type="checkbox"/> Not Cons. <input type="checkbox"/> Cons./not App.
			<input type="checkbox"/> List/not Design. <input type="checkbox"/> Design./not List
MTO Region	30   Southwestern	Road Class:	<input type="checkbox"/> Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input checked="" type="checkbox"/> Local
MTO District	31   London / Stratford	Posted Speed	70
Old County	20   Norfolk	No. of Lanes	2
Geographic Twp.	585   South Walsingham	AADT	3739
Structure Type	22   Undefined	% Trucks	
Total Deck Length	32.9 (m)	Inspection Route Sequence	
Overall Str. Width	11.3 (m)	Interchange Number	
Total Deck Area	371.8 (m <sup>2</sup> )	Interchange Structure Number	
Roadway Width	10.1 (m)	Min. Vertical Clearance	(m)
Skew Angle	(Degrees)	Special Route	<input type="checkbox"/> Truck <input checked="" type="checkbox"/> Emergency <input type="checkbox"/> School <input type="checkbox"/> Bicycle
No. of Spans	7	Detour Length Around Bridge	0 (km)
Span Length	1 @ 4.1, 4 @ 4.9, 1 @ 4.8, 1 @ 4.4		(m)
		Direction of Structure	North / South
		Fill on Structure	0 (m)

**Historical Data:**

Year Built	1959	Year of Last Major Rehab.	1997
Last OSIM Inspection	June 17, 2014	Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat, lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

1997 - Deck post tensioning - waterproofing - new asphalt wearing surface on deck.

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Field Inspection Information:		
Date of Inspection:	July 5, 2016	Type of Inspection: <input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Matt Alderson, G. Douglas Vallee Ltd.	
Others in Party:	Andrew Vallee	
Access Equipment Used:	Hammer, Binoculars, Measuring Tape, Camera, etc.	
Weather:	Sunny	
Temperature:	27 °C	

Additional Investigation Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
<input checked="" type="checkbox"/> Detailed Deck Condition Survey:		<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Non-destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/> Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/> Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/> Detailed Timber Investigation		<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Post-Tensioned Strand Investigation	<input checked="" type="checkbox"/>		
Underwater Investigation:		<input checked="" type="checkbox"/>	
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
<input checked="" type="checkbox"/> Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/> Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			
Underwater investigation recommended. Wooden pile not visible under water level. A longitudinal crack pattern in the first span (South end) is showing in the asphalt surface. Gabion basket protection at both abutments show failure.			

Overall Structure Notes:			
Recommended Work on Structure:	<input type="checkbox"/> None <input type="checkbox"/> Maintenance	<input type="checkbox"/> Minor Rehab. <input checked="" type="checkbox"/> Major Rehab.	<input type="checkbox"/> Replace
Timing of Recommended Work:	<input checked="" type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years		
Overall Comments:	Major rehab or replace in 1-5 years.		
Date of next Inspection:	July 5, 2018		

**Suspected Performance Deficiencies**

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

**Maintenance Needs**

- |                                      |                                 |  |
|--------------------------------------|---------------------------------|--|
| 01 Lift and swing bridge maintenance | 07 Repair to structural steel   | 13 Erosion control at bridges            |
| 02 Bridge cleaning                   | 08 Repair of bridge concrete    | 14 Concrete sealing                      |
| 03 Bridge handrail maintenance       | 09 Repair of bridge timber      | 15 Rout and seal                         |
| 04 Painting steel bridge structures  | 10 Bailey bridges - maintenance | 16 Bridge deck drainage                  |
| 05 Bridge deck joint repair          | 11 Animal/pest control          | 17 Scaling (Loose concrete or ACR steel) |
| 06 Bridge bearing maintenance        | 12 Bridge surface repair        | 18 Other                                 |

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Rehabilitation Required:		Element	Priority				Estimated Construction Cost
Rehab	Replace		Urgent	Within 1 yr	1-5 yrs	6-10 yrs	
X		Wearing Surface (Approaches)			X		
X		Embankments			X		
		Abutment Walls					\$5,000
X		Posts			X		
X		Railing System			X		
X		Deck Top			X		
		Soffit Thin Slab					
		Streams and Waterways					
X		Wearing Surface			X		
		Caps					
X		Shafts/Columns/Pile Bents			X		
		Sign					
X		Curbs			X		
		Shafts/Columns/Pile Bents					
		<b>Structure Replacement</b>					\$1,700,000
Total Cost							\$1,705,000

Associated Work:	Comments	Estimated Construction Cost
Additional Investigations	Geotech. Report	\$20,000
Traffic Management	Temporary Crossing	\$70,000
Utilities		\$15,000
Road Allowance	Legal Survey	\$4,500
Environmental Assessment		\$70,000
Engineering		\$85,000
Other	Material Testing	\$10,000
Contingencies		\$25,000
Total Cost		\$299,500

**Justification:**

Notes: Estimate for the replacement of the bridge is shown.

Construction Cost:	\$1,705,000
Associated Work Cost:	\$299,500
<b>TOTAL Estimated Cost:</b>	<b>\$2,004,500</b>

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**Element Data**

Element Group:	1600 Approaches					Length:	50
Element Name:	1601 Wearing Surface (Approaches)					Width:	7
Location:	North and south					Height:	
Material:	2 Asphalt					Count:	1
Element Type:						Total Quantity:	350 sq.m
Environment:	Severe					Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition	Units	Exc.	Good	Fair	Poor		
Data:	sq.m	0	0	349	1		
Comments: Deep cracking of asphalt at approaches. Settlement at approach joints.							
Recommended Work:    Rehab <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input checked="" type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	1400 Embankments & Streams					Length:	15
Element Name:	1402 Embankments					Width:	2
Location:	N & S					Height:	1
Material:						Count:	2
Element Type:						Total Quantity:	60 sq.m
Environment:	Severe					Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition	Units	Exc.	Good	Fair	Poor		
Data:	sq.m	0	0	30	30		
Comments: Gabion baskets - most are open and deforming should be replaced.							
Recommended Work:    Rehab <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input checked="" type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	900 Abutments					Length:	
Element Name:	901 Abutment Walls					Width:	11.3
Location:	N & S					Height:	2
Material:	18 Wood					Count:	2
Element Type:	Crib or Gabion					Total Quantity:	45.2 sq.m
Environment:	Benign					Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition	Units	Exc.	Good	Fair	Poor		
Data:	sq.m	0	39.2	6	0		
Comments: Gabion basket are falling apart. Some bulging occurring at abutment walls. Missing board on South abutment wall.							
Recommended Work:    Rehab <input type="checkbox"/> Replace <input type="checkbox"/> Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs:    Other - Replace missing board <input type="checkbox"/> <input type="checkbox"/> Urgent <input checked="" type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

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**Element Data**

Element Group:	400 Barriers					Length:	
Element Name:	403 Posts					Width:	
Location:	E & W					Height:	
Material:						Count:	30
Element Type:						Total Quantity:	30 Each
Environment:	Severe					Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition Data:	Units Each	Exc. 0	Good 15	Fair 0	Poor 15		
Comments: Half of posts (15) should be replaced.							
Recommended Work:    Rehab <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input checked="" type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	400 Barriers					Length:	125.4
Element Name:	402 Railing System					Width:	
Location:						Height:	
Material:	14 Steel					Count:	1
Element Type:	Steel Flex Beams on Wood Post					Total Quantity:	125.4 m
Environment:	Severe					Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition Data:	Units m	Exc. 0	Good 0	Fair 120	Poor 5.4		
Comments: Replace all railing. Many posts are rotten. Steel beam is loose.							
Recommended Work:    Rehab <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input checked="" type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	100 Decks					Length:	
Element Name:	102 Deck Top					Width:	
Location:						Height:	
Material:	18 Wood					Count:	30
Element Type:	Wood Planks					Total Quantity:	30 sq.m
Environment:						Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition Data:	Units sq.m	Exc. 0	Good 25	Fair 5	Poor 0		
Comments: Bottom rods - pressure plates and beams all visible and in good condition. Steel channels show surface corrosion on flanges. Difficult to observe due to post-tension components. Post tension cables are loose.							
Recommended Work:    Rehab <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input checked="" type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs:    Other - Tighten Post Tension <input checked="" type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

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**Element Data**

Element Group:	100 Decks					Length:	32.9
Element Name:	103 Soffit Thin Slab					Width:	11.3
Location:	Top of Piers					Height:	
Material:						Count:	1
Element Type:						Total Quantity:	371.8 sq.m
Environment:	Moderate					Limited Inspection:	<b>X</b>
Protection System:	Creosote					Perform. Deficiencies	
Condition	Units	Exc.	Good	Fair	Poor		
Data:	sq.m	0	0	371.8	0		
Comments: Not visible from top side. One (1) loose deck slat at South span soffit by south abutment. Two (2) loose deck slats at North span soffit by north abutment. Limited inspection for centre spans.							
Recommended Work: Rehab <input type="checkbox"/> Replace <input type="checkbox"/> Timing: Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	1400 Embankments & Streams					Length:	
Element Name:	1401 Streams and Waterways					Width:	
Location:	Big Creek					Height:	
Material:						Count:	1
Element Type:						Total Quantity:	1 Each
Environment:						Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition	Units	Exc.	Good	Fair	Poor		
Data:	Each	0	1	0	0		
Comments: Washout at NE wall.							
Recommended Work: Rehab <input type="checkbox"/> Replace <input type="checkbox"/> Timing: Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	100 Decks					Length:	44
Element Name:	101 Wearing Surface					Width:	10
Location:	Top of Deck					Height:	
Material:	2 Asphalt					Count:	1
Element Type:						Total Quantity:	440 sq.m
Environment:	Severe					Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition	Units	Exc.	Good	Fair	Poor		
Data:	sq.m	0	0	340	100		
Comments: Small crack in road surface at each end of deck. Should be routed and sealed. Waterproofing is not visible, placed in 1997. Some transverse cracking in surface. Pot holes forming. Settlement on deck surface.							
Recommended Work: Rehab <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Timing: Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input checked="" type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

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**Element Data**

Element Group:	1000 Piers					Length:	
Element Name:	1002 Caps					Width:	
Location:	Top of Piles					Height:	
Material:	18 Wood					Count:	7
Element Type:						Total Quantity:	7 Each
Environment:	Benign					Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition Data:	Units Each	Exc. 0	Good 7	Fair 0	Poor 0		
Comments: Square beams.							
Recommended Work:						Maintenance Needs:	
Rehab <input type="checkbox"/> Replace <input type="checkbox"/> Timing: Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						<input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	1000 Piers					Length:	4
Element Name:	1001 Shafts/Columns/Pile Bents					Width:	0.2
Location:	Cross Braces					Height:	0.1
Material:	18 Wood					Count:	42
Element Type:						Total Quantity:	3 sq.m
Environment:	Moderate					Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition Data:	Units sq.m	Exc. 0	Good 0	Fair 2.9	Poor 0.1		
Comments: 42 braces total. 6 steel, 36 wood. 2 wooden braces require replacement. 7 timber piles with capping beam in fair shape							
Recommended Work:						Maintenance Needs:	
Rehab <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Timing: Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input checked="" type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						<input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	1500 Signs					Length:	
Element Name:	1501 Sign					Width:	
Location:	N & S					Height:	
Material:	14 Steel					Count:	4
Element Type:						Total Quantity:	4 Each
Environment:						Limited Inspection:	
Protection System:	Unknown					Perform. Deficiencies	
Condition Data:	Units Each	Exc. 0	Good 4	Fair 0	Poor 0		
Comments: Hazard markings.							
Recommended Work:						Maintenance Needs:	
Rehab <input type="checkbox"/> Replace <input type="checkbox"/> Timing: Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input type="checkbox"/> 6 - 10 yr <input type="checkbox"/>						<input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	



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**Element Data**

Element Group:	300	Sidewalks/curbs	Length:	
Element Name:	302	Curbs	Width:	
Location:			Height:	
Material:	18	Wood	Count:	1
Element Type:			Total Quantity:	1 Each
Environment:		Severe	Limited Inspection:	
Protection System:		Unknown	Perform. Deficiencies	
Condition Data:	Units Each	Exc. 0	Good 0	Fair 0
			Poor 1	
Comments: Curbs are rotten on East side.				
Recommended Work:    Rehab <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input checked="" type="checkbox"/> 6 - 10 yr <input type="checkbox"/>			Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	

Element Group:	1000	Piers	Length:	
Element Name:	1001	Shafts/Columns/Pile Bents	Width:	
Location:			Height:	
Material:	14	Steel	Count:	16
Element Type:			Total Quantity:	16 sq.m
Environment:		Severe	Limited Inspection:	
Protection System:		Unknown	Perform. Deficiencies	
Condition Data:	Units sq.m	Exc. 0	Good 16	Fair 0
			Poor 0	
Comments: Moderate deterioration.				
Recommended Work:    Rehab <input type="checkbox"/> Replace <input type="checkbox"/> Timing:    Urgent <input type="checkbox"/> < 1yr <input type="checkbox"/> 1 - 5 yr <input type="checkbox"/> 6 - 10 yr <input type="checkbox"/>			Maintenance Needs: <input type="checkbox"/> Urgent <input type="checkbox"/> 1 year <input type="checkbox"/> 2 year	



Figure 1 North Approach



Figure 2 South Approach





Figure 3 East Profile



Figure 4 West Profile



Figure 5 Upstream



Figure 6 Downstream





Figure 7 North Abutment



Figure 8 South Abutment





Figure 9 North Pier



Figure 10 Piers





Figure 11 Soffit



Figure 12 Shear Panel





Figure 13 South Abutment Deterioration



Figure 14 Steel Pier Reinforcement





Figure 15 Loose Post Tension Strands



Figure 16 Deteriorated Gabion Basket





Figure 17 Missing Board in Ballast Wall



Figure 18 South Gabion Wall Deterioration



Figure 19      Typical Wood Pile



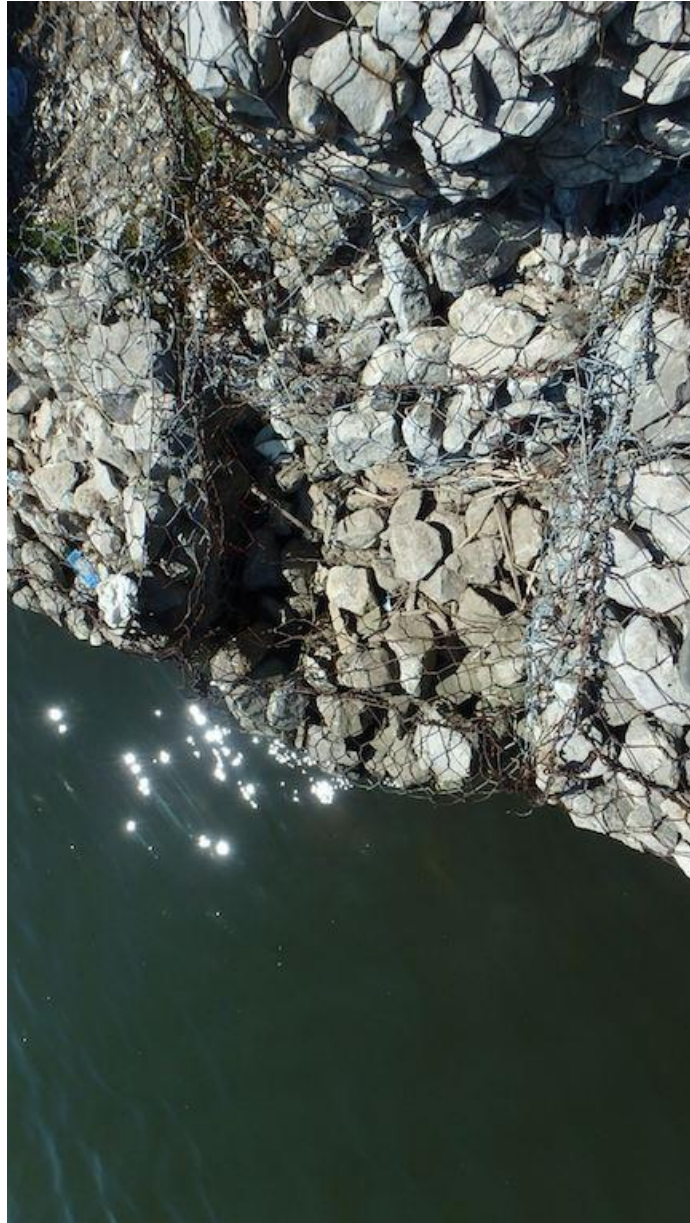


Figure 20 Missing Portion of Gabion Retaining Wall



Figure 21 Typical Post Deterioration





Figure 22      Deterioration of Wood Curb



Figure 23      Insect Damage to Guiderail Post





Figure 24 Corrosion on Guiderail



Figure 25 Asphalt Spillway





Figure 26 Settlement at North Joint





Figure 27      South Joint



Figure 28 Transverse Cracks and Settlement on Deck Wearing Surface