

#### MUNICIPALITY OF NORTHERN BRUCE PENINSULA

## 2024 STRUCTURE INSPECTION REPORT



vsp

WSP 1051 2ND AVE. EAST OWEN SOUND, ON, CANADA N4K 2H8

T +1 519 376-7612 wsp.com



## 2024 STRUCTURE INSPECTION REPORT

#### MUNICIPALITY OF NORTHERN BRUCE PENINSULA

FINAL PROJECT NO.: CA0043256.3165 DATE: MARCH 06, 2025

WSP 1051 2ND AVE. EAST OWEN SOUND, ON, CANADA N4K 2H8

T: +1 519 376-7612 F: +1 519 376-8008 WSP.COM

## **NSD**

## TABLE OF CONTENTS

- 1 TABLE 1 BRIDGE/CULVERT INVENTORY/RECOMMENDATION SUMMARY
- 2 TABLE 2 BRIDGE CONDITION INDEX (BCI) VALUES
- 3 TABLE 3 BRIDGE/CULVERT MAINTENANCE REQUIREMENTS SUMMARY
- 4 FIGURE 1 BRIDGE AND CULVERT LOCATIONS
- 5 STRUCTURE INSPECTION REPORTS

TABLE 1

Bridge/Culvert Inventory/Recommendation Summary Repair/Replacement Recommendations and Financial Plan Municipality of Northern Bruce Peninsula

March	h 2025 CA0043256.3165															
No	Newell costien	Bridge or	Time	Span	Year Built/	Condition		Load Limit		Recommendati	ons	Repai	rs/Upgrades	Estimated	Estimat Expec	ed Life tancy
NO.	Culvert	туре	(m)	Repaired	Condition	Existing	Load Limit Analysis Required	Annual Inspections Recommended	Repair/Rehabilitation	Replacement	Time (Years)	Estimated Cost	(2025 Dollars)	As-Is	With Repairs	
1	4th Conc. Culvert S. of Barrow Bay Rd. (Judges Creek)	Culvert	Steel MPPA	7.0	2024	Excellent	-	-	-	-	-	N/A	-	\$550,000	2075	2075
2	10th Sideroad Culvert, Lot 10, Conc 2 E (Judges Creek)	Culvert	Steel MPPA	5.9	2024	Excellent	-	-	-	-	-	N/A	-	\$475,000	2075	2075
3	Cherry Hill Road Bridge, Lot 6 (N. Monument Corners) (Stokes - Chin Creek)	Bridge	Concrete Beam	6.1	1940	Fair/Poor	15 t	Yes	Yes	*AB, BP, CR, EP	Yes	0-1	\$175,000	\$625,000	2026	-
4	Spring Creek Bridge, Ira Lake Road (Old Hwy 6)	Bridge	Concrete Rigid Frame	4.5	1925	Poor	5 t	Yes	Yes	*AB, BP, CR, EP	Yes	0-1	\$275,000	\$625,000	2026	-
5	Stokes Bay Road Bridge (Copper Kettle) (Stokes Sideroad)	Bridge	Concrete Rigid Frame	7.9	1950/1988	Good/Fair	-	-	-	AB, BP, EP, EMP, CR	-	1-5	\$175,000	\$825,000	2035	2050
6	Heron Point Road Bridge, Stokes River	Bridge	Concrete Rigid Frame	7.1	1952	Poor	12 t	Yes	Yes	*AB, EP, CR	Yes	0-1	\$300,000	\$725,000	2026	-
7	Lindsay Road 5 Culvert, Stokes River	Culvert	Concrete Rigid Frame	7.3	1972	Good	-	-	-	**AB, BP, CR, EP, SG	-	0-1	\$75,000	\$750,000	2045	2073
8	Isthmus Bay Road Bridge, Swan Lake Drain	Bridge	Concrete Rigid Frame	6.6	1950/2023	Good	-	-		-		-	-	\$675,000	2075	2075
9	Cape Chin Culvert (S. Cape Chin Sideroad), Chin Creek	Culvert	Concrete Rigid Frame (Arch)	4.3	2008	Good	-	-	-	BP, EP	-	0-1	\$5,000	\$450,000	2054	2084
10	Lindsay Road 5 Culvert (Chin Creek)	Culvert	Steel MPPA	4.4	1970	Fair/Poor	-	-	-	**AB, BP, SG	Consider	0-1	\$50,000	\$350,000	2029	2046
11	Myles Bay Shore Road Bridge	Bridge	Concrete Rigid Frame	7.3	2001	Good	-	-	-	*AB, BP, EP, CR	-	0-1	\$100,000	\$750,000	2060	2102
12	Stokes Bay Road Culvert (Old Woman's River)	Culvert	Steel MPPA	4.7	1967	Fair	-	-	Yes	**AB, BP, EP, SG	Consider	0-1	\$75,000	\$375,000	2027	2043
13	Bury Road Bridge, Old Woman's River (Fern Creek Drain)	Bridge	Concrete Slab	6.1	1960's	Fair/Poor	15 t	Yes	Yes	*AB, BP, EP, CR	Consider	1-5	\$150,000	\$625,000	2026	2056
14	East Road Culvert (N. Cape Chin Rd. 4) (Chin Creek - Stokes Road)	Culvert	Steel MPPA	3.7	1975/2007	Good/Fair	-	-	-	-	-	-	\$5,000	\$300,000	2035	2051
15	Conc. 4 Culvert (S. of Sideroad 10)	Culvert	Steel CSP	3.1	2014	Good	-	-	-	*AP, BP	-	1-5	\$75,000	\$250,000	2054	2075
16	Barrow Bay Road Culvert, E. of Conc. 4, Judges Creek	Culvert	Steel MPPA	7.0	1980	Fair	-	-	-	EP, BP	-	1-5	\$5,000	\$550,000	2030	2051
17	Conc. 4 Culvert (N. Barrow Bay Road)	Culvert	Steel MPPA	3.6	1980	Good	-	-	-	*AB, BP, EP	-	0-1	\$75,000	\$300,000	2030	2046
18	10th Sideroad Culvert, Judges Creek, Br. Drain	Culvert	Steel CSP	3.5	1990	Good	-	-	-	*AB, BP	-	0-1	\$75,000	\$275,000	2040	2061
19	Pike Bay Road Culvert, Judges Creek	Culvert	Steel MPPA	4.5	1990	Good	-	-	-	AB, BP, EP, SG	-	0-1	\$20,000	\$350,000	2040	2061
	Totals												\$1,635,000	\$9,825,000		

Note: Life Expectancy for Concrete Structures Life Expectancy for CSP - MPPA Pre 1960 = 60 - 80 years Between 1960-1980 = 70 - 90 years All years = 40 to 50 years Post 1980 = 80 - 100 years

AP = Approach

BAP = Barrier Posts

Legend (Upgrade/Repair Symbols): CR = Concrete Repair

- BP = Barrier Protection
- AB = Approach Barriers
- EP = Erosion Protection
- EMP = Embankment Protection
- SG = Signage

\*Post or maintain warning speed reduction 35 km/hr. until AB & BP installed or upgraded. \*\*Post or maintain warning speed reduction 45 km/hr. until AB & BP installed or upgraded.

# Table 2Bridge Condition Index (BCI) ValuesMunicipality of Northern Bruce Peninsula

March 2025			CA0043256.3165
Structure ID	Name	Age	BCI
1	Concession 4 Bridge	<1	99.86
2	Sideroad 10 Bridge	<1	99.86
3	Cherry Hill Road Bridge	85	36.05
4	Spring Creek (Ira Lake Road) Bridge	100	18.03
5	Copper Kettle (Stokes Bay Road) Bridge	75	59.45
6	Heron Point Road Bridge	73	22.20
8	Isthmus Bay Road Bridge	75	62.24
9	Cape Chin Culvert	17	60.50

Legend

Range Colour		Recommendation
80-100	Excellent	Continue Monitoring and Maintenance
60-80	Good	Continue Monitoring and Maintenance
40-60	Fair	Initiate planning for future repairs
0-40	Poor	Schedule repairs in immediate future

#### TABLE 3 Bridge/Culvert Maintenance Requirements Summary Municipality of Northern Bruce Peninsula

March	2025					CA0043256.3165
No.	Name/Location	Bridge / Culvert	Туре	Condition	Maintenance Requirement	Time (Years)
1	4th Conc. Culvert S. of Barrow Bay Rd. (Judges Creek)	Culvert	Steel MPPA	Excellent	<ul> <li>Grade the wearing surface for drainage</li> <li>Grade the shoulders and clear vegetation for drainage</li> </ul>	0-1
2	10th Sideroad Culvert, Lot 10, Conc 2 E (Judges Creek)	Culvert	Steel MPPA	Excellent	<ul><li>Grade the wearing surface for drainage</li><li>Grade the shoulders and clear vegetation for drainage</li></ul>	0-1
3	Cherry Hill Road Bridge, Lot 6 (N. Monument Corners) (Stokes - Chin Creek)	Bridge	Concrete Beam	Fair/Poor	<ul> <li>Grade the wearing surface for drainage</li> <li>Grade the shoulders and clear vegetation for drainage</li> <li>Clear debris along curbs for drainage</li> <li>Straighten narrow bridge sign post</li> </ul>	0-1
4	Spring Creek Bridge, Ira Lake Road (Old Hwy 6)	Bridge	Concrete Rigid Frame	Poor	<ul> <li>Grade the shoulders and clear vegetation for drainage</li> <li>Clear debris along curbs for drainage</li> <li>Align existing signs vertically and with traffic</li> </ul>	0-1
5	Stokes Bay Road Bridge (Copper Kettle) (Stokes Sideroad)	Bridge	Concrete Rigid Frame	Good/Fair	Grade the shoulders and clear vegetation for drainage	0-1
6	Heron Point Road Bridge, Stokes River	Bridge	Concrete Rigid Frame	Poor	Grade the shoulders and clear vegetation for drainage	0-1
7	Lindsay Road 5 Culvert, Stokes River	Culvert	Concrete Rigid Frame	Good	<ul> <li>Place four (4) End Hazard signs</li> <li>Place reduced speed limit 45 km/hr signage at each approach (or install barrier protection)</li> </ul>	0-1
8	Isthmus Bay Road Bridge, Swan Lake Drain	Bridge	Concrete Rigid Frame	Good	<ul> <li>Grade the shoulders and clear vegetation for drainage</li> </ul>	0-1
9	Cape Chin Culvert (S. Cape Chin Sideroad), Chin Creek	Culvert	Concrete Rigid Frame (Arch)	Good	<ul><li>Tighten guiderail cable</li><li>Replace rotten guiderail posts</li></ul>	0-1
10	Lindsay Road 5 Culvert (Chin Creek)	Culvert	Steel MPPA	Fair/Poor	<ul> <li>Place four (4) End Hazard signs</li> <li>Clear blockage from waterway upstream of culvert</li> </ul>	0-1
11	Myles Bay Shore Road Bridge	Bridge	Concrete Rigid Frame	Good	<ul> <li>Place two (2) 35km/hr warning signs at each approach (or install barrier protection)</li> <li>Clear debris along curbs for drainage</li> <li>Repair embankment erosion</li> </ul>	0-1
12	Stokes Bay Road Culvert (Old Woman's River)	Culvert	Steel MPPA	Fair	<ul> <li>Place reduced speed limit 45 km/hr signage at each approach (or install barrier protection)</li> </ul>	0-1
13	Bury Road Bridge, Old Woman's River (Fern Creek Drain)	Bridge	Concrete Slab	Fair/Poor	<ul> <li>Grade the wearing surface for drainage</li> <li>Grade the shoulders and clear vegetation for drainage</li> <li>Clear debris along curbs for drainage</li> <li>Replace missing narrow structure sign.</li> </ul>	1-5
14	East Road Culvert (N. Cape Chin Rd. 4) (Chin Creek - Stokes Road)	Culvert	Steel MPPA	Good/Fair	<ul> <li>Tighten guiderail cable</li> <li>Repair guiderail connections.</li> <li>Replace damaged post reflectors</li> <li>Clear obstruction inside culvert</li> </ul>	0-1
15	Conc. 4 Culvert (S. of Sideroad 10)	Culvert	Steel SCP	Good	<ul> <li>Grade the wearing surface for drainage</li> <li>Grade the shoulders and clear vegetation for drainage</li> <li>Clear obstruction at lower culvert inlet</li> <li>Replace damaged sign</li> </ul>	0-1
16	Barrow Bay Road Culvert, E. of Conc. 4, Judges Creek	Culvert	Steel MPPA	Fair	<ul> <li>Place erosion / embankment protection.</li> <li>Replace rotten barrier posts</li> <li>Tighten guiderail cable</li> </ul>	1-5
17	Conc. 4 Culvert (N. Barrow Bay Road)	Culvert	Steel MPPA	Good	<ul> <li>Grade the wearing surface for drainage</li> <li>Grade the shoulders and clear vegetation for drainage</li> </ul>	0-1
18	10th Sideroad Culvert, Judges Creek, Br. Drain	Culvert	Steel CSP	Good	<ul> <li>Grade the wearing surface for drainage</li> <li>Grade the shoulders and clear vegetation for drainage</li> </ul>	0-1
19	Pike Bay Road Culvert, Judges Creek	Culvert	Steel MPPA	Good	<ul> <li>Grade the shoulders and clear vegetation for drainage</li> </ul>	0-1



COPYRIGHT @ WSP

## **Bridge/Culvert Inspection Report**

Site Number

Structure Name

**MTO Region Code** 

**MTO District Code** 

1	
4th Companying Drides	
4th Concession Bridge	
30	
33	
33	

Project Number

CA0043256.3165

Municipality

County

Geographic Twp Code

Northern Bruce Peninsula									
Bruce	Code	02							
	377								



## wsp

1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

### Bridge/Culvert Inspection Report

#### **Inventory Data**

Structure Name	4th Concession Bridge	Site Number	1
County	Bruce	Road Name	4th Concession
Municipality	Northern Bruce Peninsula	Road Type	Rural Local - Gravel
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula
Structure Type	Steel - MP-PA	AADT	100
Span (m)	7.04 No. 1	% Trucks	15%
Height (m)	4.06	Overall Structure Width (m)	12.9
Direction of Structure	East/West - 22° skew	Roadway Width (m)	6.2
Year Built/Rehabilitated	2024	Total Deck Length (m)	12
Current Load Limit		Total Deck Area (s.m.)	74.4
Detour Length (km)	6	Heritage Des.	None
Waterway	Judges Creek		
Inspection Data			
Date of Inspection	October 29, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	1-1: Title Page 1-2: View of culvert in elevat	ion and inlet components
Equipment Used	Таре	1-3: View of culvert in elevat 1-4: View of culvert barrel in	terior
Weather Conditions	Sun & Cloud	1-5: View of emankment and 1-6: View of watercourse ups	wingwall (typ.) tream
Temperature	13°C	1-7: View of watercourse dov	vnstream
Last Inspection	December 5, 2022		
Additional Investigation Required			
Total Rehabilitation			
Total Pehabilitation			
Budget Costing		Next Inspection	October 2026

Structure: 1

Element Group: Decks		Length:		12						
Element Name:	nent Name: Wearing Surface		Width:		6.2					
Location:			Height:							
Material:	Gravel		Count:			1				
Element Type:			Total Quantity:			74.4				
Environment:	Severe	Severe								
Protection System:	tection System:									
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs			
	%		100							
Comments:										
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent					

#### Element Data

Element Group:	nent Group: Barriers		Length:				
Element Name:	Guiderail		Width:				
Location:	Each Side		Height:				
Material:	Steel		Count:				
Element Type:	Flex Beam		Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:			None	-			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%						
Comments:	Proposed guiderail not yet	in place at the	e time of the inspec	tion.			
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent							

Element Group:	Culverts	Culverts			10.5					
Element Name:	Element Name: Inlet Component		Width:							
Location:	West End		Height:			5.5				
Material:	Steel		Count:			1				
Element Type:	Corrugated Steel H	leadwall	Total Quantity:		5	57.75				
Environment:	Severe		Limited Insp'n:							
Protection System:			None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs			
	%	100								
Comments:						· · · · · ·				
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent					

Structure:	1

Element Group: Culverts		Length:			10.5		
Element Name:	Outlet Compon	Outlet Components					
Location:	East End		Height:			5.5	
Material:	Steel		Count:			1	
Element Type:	Corrugated Steel H	leadwall	Total Quantity:		5	7.75	
Environment:	Severe		Limited Insp'n:				
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
[	%						
Comments:							
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Culvert		Length:	12.9					
Element Name:	Barrel		Width:	7.04					
Location:			Height:		4.06				
Material:	Steel		Count:			1			
Element Type:	Multi-plate Pipe Arch		Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:		zed							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%	100							
Comments:									
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Element Group:	Foundatio	วท	Length:						
Element Name:	Foundation (belo	w grade)	Width:						
Location:			Height:						
Material:	Gravel / Str	one	Count:						
Element Type:			Total Quantity:						
Environment:	Moderate		Limited Insp'n:		Yes				
Protection System:			None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%	100							
Comments:	Limited inspection due	to cover. Exce	llent condition ass	sumed base	d on recent	construction.			
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Structure: 1

Element Group:	Streams/Embar	kments	Length:				
Element Name:	Streams and Wa	aterways	Width:				
Location:			Height:				
Material:			Count:				
Element Type:							
Environment:	Moderate	Moderate					
Protection System:			Nor	ne			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:			-				
Recommended Work	: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Streams/Emban	kments	Length:					
Element Name:	Embankme	nt	Width:					
Location:	Each Corne	er	Height:					
Material:	Stone		Count:			4		
Element Type:	Rip Rap 7		Total Quantity:					
Environment:	Moderate		Limited Insp'n:					
Protection System:			Non	е				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each		4				Yes	
<b>Comments:</b> Proposed rip-rap embankment protection not yet installed at the time of the inspection.								
Recommended Work	K: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Signs		Length:				
Element Name:	Signs		Width:				
Location:	Each Corn	er	Height:				
Material:			Count:				
Element Type:							
Environment:	Severe		Limited Insp'n:			Yes	
Protection System:			Non	е			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each						
Comments:	Proposed signage was	s not yet in pl	ace at the time of	the inspecti	on.		
Recommended Worł	<: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Approache	Approaches					
Element Name:	Wearing Sur	face	Width:				
Location:	Each End	1	Height:				
Material:	Gravel		Count:				
Element Type:							
Environment:	Severe	Severe					
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:							
Recommended Work:	None	None 6-10 Years		< 1 Year	Urgent		



Photo 1-2: View of culvert in elevation and inlet components



Photo 1-3: View of culvert in elevation and outlet components



Photo 1-4: View of culvert barrel interior



Photo 1-5: View of emankment and wingwall (typ.)



Photo 1-6: View of watercourse upstream



Photo 1-7: View of watercourse downstream

## **Bridge/Culvert Inspection Report**

Site Number	2	Project Number	CA0043256.3165		
Structure Name	10th Sideroad Bridge	Municipality	Northern Brue	ce Penins	ula
MTO Region Code	30	County	Bruce	Code	02
MTO District Code	33	Geographic Twp Code		377	



## vsp

1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

### Bridge/Culvert Inspection Report

#### **Inventory Data**

Structure Name	10th Sideroad Bridge	Site Number	2		
County	Bruce	Road Name	10th Sideroad		
Municipality	Northern Bruce Peninsula	Road Type	Rural Local		
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula		
Structure Type	Steel MP-PA	AADT	150		
Span (m)	5.89 No. 1	% Trucks	15%		
Height (m)	3.71	Overall Structure Width (m)	9.85		
Direction of Structure	North/South - 15° skew	Roadway Width (m)	6		
Year Built/Rehabilitated	2024	Total Deck Length (m)	9.9		
Current Load Limit		Total Deck Area (s.m.)	59.4		
Detour Length (km)	6	Heritage Des.	None		
Waterway	Judges Creek				
Inspection Data					
Date of Inspection	October 29, 2024	Photos:			
Name of Inspector	Evan Montreuil, P.Eng.	1-1: Title Page 1-2: View of culvert in elevati	on and inlet components		
Equipment Used	Таре	1-3: View of culvert in elevation 1-4: View of culvert barrel int	erior		
Weather Conditions	Sun & Cloud	1-5: View of emankment and 1-6: View of watercourse upst	wingwall (typ.) ream		
Temperature	13°C	1-7: View of watercourse dow	instream		
Last Inspection	December 5, 2022				
Additional Investigation Required					
Total Rehabilitation					
Total Rehabilitation Budget Costing		Next Inspection	October 2026		
Justification					

Structure: 2

Element Group:	Decks		Length:		9.9				
Element Name:	Wearing Surfa	ace	Width:		6				
Location:			Height:						
Material:	Gravel		Count:			1			
Element Type:			Total Quantity:		1	59.4			
Environment:	Severe		Limited Insp'n:						
Protection System:			None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%		100						
Comments: Gavel wearing surface over concrete distribution pad									
Recommended Wor	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

#### Element Data

Element Group:	Barriers		Length:				
Element Name:	Guiderail		Width:				
Location:	Each Side		Height:				
Material:	Steel		Count:				
Element Type:	Flex Beam		Total Quantity:				
Environment:	Severe	Severe					
Protection System:		None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%						
Comments:	Proposed guiderail not yet	in place at the	time of the inspec	tion.			
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Culverts		Length:		8					
Element Name:	Inlet Compone	Inlet Component								
Location:	West End		Height:		5.8					
Material:	Steel		Count:			1				
Element Type:	Corrugated Steel H	Corrugated Steel Headwall				46.4				
Environment:	Severe		Limited Insp'n:							
Protection System:		None				-				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs			
	%	100								
Comments:										
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent					

Structure:	2
------------	---

Element Group:	Culverts		Length:			8		
Element Name:	Outlet Compon	nents	Width:					
Location:	East End		Height:			5.8		
Material:	Steel		Count:			1		
Element Type:	Corrugated Steel H	Corrugated Steel Headwall			4	46.4		
Environment:	Severe		Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%							
Comments:								
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent			

#### Element Data

Element Group:	Culvert		Length:		9.85				
Element Name:	Barrel		Width:		5.89				
Location:			Height:			3.71			
Material:	Steel		Count:			1			
Element Type:	Multi-plate Pipe Arch		Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:		Galvanized							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%	100							
Comments:									
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Element Group:	Foundatio	วท	Length:					
Element Name:	Foundation (belo	w grade)	Width:					
Location:			Height:					
Material:	Gravel / Stone		Count:					
Element Type:			Total Quantity:					
Environment:	Moderate		Limited Insp'n:			Yes		
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%	100						
Comments:	Limited inspection due	to cover. Exce	llent condition ass	sumed base	d on recent	construction.		
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Streams/Emban	kments	Length:					
Element Name:	Streams and Wa	terways	Width:					
Location:			Height:					
Material:			Count:					
Element Type:			Total Quantity:					
Environment:	Moderate		Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100					
Comments:								
Recommended Work	:: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

#### Element Data

Element Group:	Streams/Emban	kments	Length:						
Element Name:	Embankme	nt	Width:						
Location:	Each Corn	Each Corner							
Material:	Stone		Count:			4			
Element Type:	Rip Rap		Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:			Non	е					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	Each		4				Yes		
Comments:									
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Element Group:	Signs		Length:					
Element Name:	Signs		Width:					
Location:	Each Corn	Each Corner						
Material:			Count:					
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:			Yes		
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each							
Comments:	Proposed signage was	s not yet in pl	ace at the time of	the inspecti	on.			
Recommended Worł	K: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Approaches		Length:				
Element Name:	Wearing Sur	face	Width:				
Location:	Each End	Each End					
Material:	Gravel		Count:				
Element Type:			Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:							
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent		



Photo 2-2: View of culvert in elevation and inlet components



Photo 2-3: View of culvert in elevation and outlet components



Photo 2-4: View of culvert barrel interior



Photo 2-5: View of embankments and wingwalls (typ.)



Photo 2-6: View of watercourse upstream



Photo 2-7: View of watercourse downstream

## **Bridge/Culvert Inspection Report**

Site Number	3	Project Number	CA00	CA0043256.3165		
Structure Name	Cherry Hill Road Bridge	Municipality	Northern Bru	ce Penins	sula	
MTO Region Code	30	County	Bruce	Code	02	
MTO District Code	33	Geographic Twp Code	377			



wsp

1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com 

#### **Inventory Data**

Structure Name	Cherry Hill Road Bridge	Site Number	3				
County	Bruce	Road Name	Cherry Hill				
Municipality	Northern Bruce Peninsula	Road Type	Rural Local				
Bridge or Culvert	Bridge	Owner	Northern Bruce Peninsula				
Structure Type	Concrete Beam	AADT	50				
Span (m)	6.1 No. 1	% Trucks	15%				
Height (m)	1.4	Overall Structure Width (m)	5.5				
Direction of Structure	East/West	Roadway Width (m)	5				
Year Built/Rehabilitated	1940	Total Deck Length (m)	7.3				
Current Load Limit	15 t	Total Deck Area (s.m.)	40				
Detour Length (km)	N/A - Dead End	Heritage Des.	None				
Waterway	Stokes/Chin Creek						
Inspection Data							
Date of Inspection	October 30, 2024	Photos:					
Name of Inspector	Evan Montreuil, P.Eng.	3-2: View of approach from the 3-3: View of upstream waterco	burse				
Equipment Used	Tape, pick, hammer	3-4: View of watercourse dow 3-5: View of barrier / parapet	wall				
Weather Conditions	Sun & Cloud	3-6: View of east elevation, gi 3-7: View of wingwall and ext	rder and barrier wall terior curb (typical)				
Temperature	20°C	<ul><li>3-8: View of exterior girder de</li><li>3-9: View of interior concrete</li></ul>	elamination and spalling girders and soffit				
Last Inspection	December 6, 2022	3-10: View of west elevation,	girder and barrier wall				
Additional Investigation Required	Deck condition survey, foundation	inspection, load limit analysis.					
Total Rehabilitation	Install approach protection and upg granulars and vegetation from the d Replacement is recommended as re	rade barrier protection to meet currer leck/curbs. Repair concrete girders, so habilitation is no longer considered c	tt code. Remove the excess offit and footings. ost effective.				
Total Rehabilitation Budget Costing	\$175,000	Next Inspection	October 2026				
Given the deteriorating condition and unknown stability of the footings, replacement is recommended over rehabilitation. Maintain load limit reduction until analysis or replacement is completed. Maintain 35 km/hr. speed limit until barrier protection is upgraded and approach protection installed.							

Structure: 3

Element Group:	Decks		Length:			7.3		
Element Name:	Wearing Surf	ace	Width:		5			
Location:			Height:					
Material:	Gravel		Count:					
Element Type:			Total Quantity:			36.5		
Environment:	Severe		Limited Insp'n:					
Protection System:								
	Lipito	Бур	Cood	Foir	Deer	Perform. Deficiencies	Maint.	
Condition Data:	Units	EXC.	Guu	Fair	P001	Deficiencies	Needs	
	m <sup>2</sup>			36.5			Yes	
Comments:	Excess granular fill and	d heavily veg	etated grass shou	ulders were	observed.			
Recommended Work: None 6-10 Years 1-5 Years <a></a> < 1 Year Urgent								
	Annual grading, vegeta bridge.	ation remova	l to maintain posit	ive drainage	e. Reduce	excess granula	r fill on	

#### Element Data

Element Group:	Decks		Length:	7.3			
Element Name:	Deck Top		Width:	5			
Location:			Height:				
Material:	Concrete	Count:					
Element Type:		Total Quantity:			36.5		
Environment:	Moderate		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	m <sup>2</sup>			36.5			Yes
m²       36.5       Yes         Comments:       The concrete deck is not visible for inspection due to cover with excessive granular fill, but is assumed to be in fair condition based on wearing surface observations.       Yes         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year							

Element Group:	Decks		Length:	7					
Element Name:	Soffit - Thick	Slab	Width:	5.5					
Location:			Height:						
Material:	Concrete		Count:						
Element Type:			Total Quantity:		28.47				
Environment:	Moderate	Limited Insp'n:							
Protection System:									
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	m <sup>2</sup>			24.20	4.27	Yes	Yes		
<b>Comments:</b> Some cracking and spalled surfaces were observed with more severe spalling of the exterior soffit.									
Recommended Work:None6-10 Years1-5 Years< 1 YearUrgentRemove all poor concrete areas, clean the reinforcing steel, and replace concrete.									

Structure: 3

#### Element Data

Element Group:	Sidewalks/cu	urbs	Length:		11.3			
Element Name:	Curbs		Width:	0.15				
Location:			Height:	0.4				
Material:	Concrete		Count:	2				
Element Type:		Т		12.43				
Environment:	Severe		Limited Insp'n:		$\checkmark$			
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>			9.3225	3.1075	Yes	Yes	
Comments:       Surface spalling of the exterior curb was observed. Limited inspection of the interior curb due to granular fill and heavily vegetated curb line.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year							due to	
	0	5		•				

#### Element Data

	11.68				
I.	Maint.				
ies	Needs				
	Yes				
heiç	ght does				
d a	top rail				
	m. i <u>cies</u> t heiç				

Element Group:	Beams/MLE	's	Length:	7			
Element Name:	Girders		Width:	0.33			
Location:			Height:	0.48			
Material:	Concrete		Count:	4			
Element Type:			Total Quantity:		3	6.12	
Environment:	Moderate		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	m <sup>2</sup>			25.284	10.836	Yes	Yes
Comments:       Severe spalling with exposed rebar observed on both exterior girders. Moderate cracking and severe spalling with exposed rebar observed on interior girders.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year       Urgent Remove delaminated/unsound concrete, clean the rebar and pour new concrete.						and	

Structure:	3

Element Group:	Abutments		Length:					
Element Name:	Abutment Wa	alls	Width:	5.5				
Location:			Height:	1.5				
Material:	Concrete		Count:	2				
Element Type:	۲		Total Quanti			16.5		
Environment:	Moderate	Limited Insp						
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>			16.5				
Comments:       Some minor surface cracking & spalling were observed. There are 4 100 mm by 100 mm rectangular drain holes.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								
Remove all poor concrete, clean remorcing steel, and replace concrete.								

#### Element Data

Element Group:	Abutments		Length:			2.5			
Element Name:	Wingwalls		Width:						
Location:			Height:	1.2					
Material:	Concrete	Concrete		4					
Element Type:		Total Quanti			12				
Environment:	Moderate	Limited Insp							
Protection System:									
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	m <sup>2</sup>			10.8	1.2		1		
Comments: Recommended Worl	Minor surface spalling   K: None   Remove all poor concr	& cracking 6-10 Year ete, clean a	were observed s 1-5 Years any exposed re	l. < 1 Year inforcing si	Urgent teel, and re	place concrete.			

Element Group:	Foundation	S	Length:					
Element Name:	Foundation (below gro	ound level)	Width:					
Location:			Height:					
Material:	Concrete	Concrete						
Element Type:	Т		Total Quanti					
Environment:	Moderate L		Limited Insp	$\checkmark$				
Protection System:								
	Unite	Exc	Good	Fair	Poor	Perform.	Maint.	
Condition Data:	Onits	LXC.	900u	i ali	1 001	Deficiencies	Needs	
						Yes	Yes	
Comments:	Comments:         Limited inspection - foundations are below water level. Visible portions of the north footing showing signs of significant erosion/undercutting.							
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent Complete thorough inspection during low water conditions to determine extend of damage.					nage.			

Structure:	3
------------	---

Element Group:	Embankments &	Streams	Length:				
Element Name:	Streams and Wa	terways	Width:				
Location:			Height:				
Material:	Earth / Stone		Count:				
Element Type:	Т		Total Quantity:				
Environment:	Moderate I		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	All			Âll			
Comments:	The watercourse appe	ars stable wi	th no obstruction	at the time	of inspection	on.	
Recommended Wo	ork: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Embankments &	Streams	Length:					
Element Name:	Embankme	nts	Width:					
Location:			Height:					
Material:	Earth / Stone C		Count:	6				
Element Type:		T		6				
Environment:	Moderate	Moderate L						
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each			6				
Comments:	The embankments are	stone / earth	(well vegetated)	and appea	r stable.			
Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								

Element Group:	Embankments & Streams		Length:						
Element Name:	Slope Protect	tion	Width:						
Location:			Height:						
Material:	Earth / Stone (		Count:		6				
Element Type:			Total Quantity:			6			
Environment:	Moderate		Limited Insp'n:						
Protection System:									
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	Each			6					
Comments:	The stone slope protect	ction appear	s stable.						
Recommended Wo	rk: None	6-10 Years	s 1-5 Years	< 1 Year	Urgent				

Structure:	3

Element Group:	Signs		Length:				
Element Name:	Signs		Width:				
Location:			Height:				
Material:	Steel		Count:	9			
Element Type:			Total Quantity:	: 9			
Environment:	Severe		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each		9				
<b>Comments:</b> Four (4) end hazard markers, one (1) load limit, one (2) narrow structure and one (2) speed limit sign in place and in good condition.							
Recommended Work: None 6-10 Years 1-5 Years <a>      Post for narrow structure/speed limit sign at the south approach is leaning toward the road and      should be straightened to reduce the chance of being damaged by snow removal or farming      equipment</a>						າd and າing	

#### Element Data

Element Group:	Approaches L		Length:	5				
Element Name:	Wearing Surface Wic		Width:	5				
Location:			Height:					
Material:	Gravel		Count:	2				
Element Type:			Total Quantity:	50				
Environment:	Severe		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform.	Maint.	
	2			50		Denciencies	Needs	
Comments:       Narrow granular surface approach is in fair condition with minor wheel path rutting observed. Heavily vegetated edge of shoulders are likely impeding drainage.								
Recommended Work:         None         6-10 Years         1-5 Years         < 1 Year         Urgent           Grade the approaches and shoulders annually to maintain adequate positive drainage.								

Element Group:	Approaches		Length:					
Element Name:	Drainage		Width:					
Location:			Height:					
Material:	Gravel		Count:					
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%			50	50	Yes	Yes	
Comments:       Heavy (grass) vegetation on shoulders should be cleared to improve drainage.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								



Photo 3-2: View of approach from the north



Photo 3-3: View of upstream watercourse



Photo 3-4: View of watercourse downstream



Photo 3-5: Barrier/parapet wall and wearing surface with wheel path rutting and encroaching vegetation



Photo 3-6: East structure elevation, exterior girder and barrier wall



Photo 3-7: Wingwall and exterior curb (typical)



Photo 3-8: Exterior girder delamination and spalling



Photo 3-9: Interior concrete girders and soffit


Photo 3-10: View of west structure elevation, exterior girder and barrier wall

## **Bridge/Culvert Inspection Report**

Site Number

4

**Project Number** 

CA0043256.3165

Structure Name

MTO Region Code

**MTO District Code** 

Ira Lake Road Bridge
30
33

Municipality

County

Geographic Twp Code

Northern Bruce Peninsula								
Bruce	Code	02						
377								





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

## Bridge/Culvert Inspection Report

Structure Name	Ira Lake Road Bridge	Site Number	4					
County	Bruce	Road Name	Ira Lake (Old Hwy #6)					
Municipality	Northern Bruce Peninsula	Road Type	Rural Local					
Bridge or Culvert	Bridge	Owner	Northern Bruce Peninsula					
Structure Type	Rigid Frame - Open Footing	AADT	150					
Span (m)	4.5 No. 1	% Trucks	15%					
Height (m)	1.2	Overall Structure Width (m)	5.7					
Direction of Structure	East/West - 15° skew	Roadway Width (m)	3.3					
Year Built/Rehabilitated	1925	Total Deck Length (m)	4.7					
Current Load Limit	5 t	Total Deck Area (s.m.)	24					
Detour Length (km)	16	Heritage Des.	None					
Waterway	Spring Creek							
Inspection Data								
Date of Inspection	October 30, 2024	Photos:						
Name of Inspector	Evan Montreuil, P.Eng.	4-1: Title page 4-2: View of east structure, win	ngwalls, exterior curb and barrier					
Equipment Used	Tape, pick, hammer	4-3: View of soffit and abutme 4-4: View of soffit	nt wall					
Weather Conditions	Sun & Cloud	4-5: View of wearing surface 4-6: View of southeast wingwa						
Temperature	20°C	4-7: View of west elevation, ex 4-8: View of watercourse upstr	eam					
Last Inspection	December 6, 2022	4-9: View of watercourse down	Istream					
Additional Investigation Required	Annual inspections, complete structural	l condition survey and load limit a	nalysis if left in service.					
Total Rehabilitation	Replacement recommended versus reha	bilitation.						
Total Rehabilitation Budget Costing	\$275,000	Next Inspection	October 2026					
Justification Due to the age and poor condition of the structure, replacement is recommended as being the most cost effective for long-term service life. Maintain load limit of 5t or reduce further following condition assessment, inspect annually and maintain speed limit of 35 km/hr until structure is replaced or when approach and barrier protection is installed to Code.								

Structure: 4

Element Group:	Decks		Length:	4.1 m						
Element Name:	Deck Top		Width:	5.1 m						
Location:			Height:		(	).3 m				
Material:	Concrete	;	Count:							
Element Type:			Total Quantity:		20	).91 m <sup>2</sup>				
Environment:	Moderate		Limited Insp'n:							
Protection System:										
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs			
	m <sup>2</sup>			15.68	5.23	Yes	Yes			
<b>Comments:</b> Limited inspection due to granular wearing surface cover, but where the deck is visible there is observed spalling and delamination.										
Recommended Wor	r <b>k:</b> None Sound deck, remove a	6-10 Years Il poor concre	1-5 Years te, clean reinforcing	< 1 Year steel, and	Urgent replace con	crete.				

#### Element Data

Element Group:	Decks		Length:	4.5 m							
Element Name:	Soffit - Thick Slab		Width:	5.7 m							
Location:			Height:		(	).3 m					
Material:	Concrete	)	Count:								
Element Type:			Total Quantity:		25	5.65 m <sup>2</sup>					
Environment:	Moderate	9	Limited Insp'n:								
Protection System:											
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs				
Condition Data:	m <sup>2</sup>			18	7.65	Yes	Yes				
m <sup>2</sup> 18       7.65       Yes       Yes         Comments:       Spalling and severe delamination with exposed steel observed around drain holes and exterior soffit.         Recommended Work:       None       6-10 Years       1-5 Years       <1 Year											

Element Group:	Decks		Length:							
Element Name:	Drainage		Width:							
Location:			Height:							
Material:	Concrete	;	Count:			4				
Element Type:			Total Quantity:			4				
Environment:	Severe		Limited Insp'n:							
Protection System:										
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs			
	Each				4	Yes	Yes			
Comments: Four 75 mm dia. holes through soffit showing severe spalling surrounding them.										
Recommended Work: None 6-10 Years 1-5 Years <a>            Remove all poor concrete, clean reinforcing steel, and replace concrete.</a>										

Structure: 4

Element Group:	Sidewalks/cu	rbs	Length:	5.1 m			
Element Name:	Curbs		Width:	0.46 m			
Location:			Height:		0.1	125 m	
Material:	Concrete		Count:			2	
Element Type:			Total Quantity:		5.	.97m <sup>2</sup>	
Environment:	Severe		Limited Insp'n:		,	Yes	
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
Environment: Protection System: Condition Data: Comments:	m²			2.99	2.99	Yes	Yes
Comments: Recommended Wo	Limited inspection due surface spalling and de ork: None Clear granular fill, remo	to cover with elamination. 6-10 Years ove all poor	h granular fill. Where 1-5 Years concrete, clean reinfo	<ul> <li>visible for i</li> <li>&lt; 1 Year</li> <li>orcing steel</li> </ul>	nspection ( Urgent , and replac	(exterior curb) t ce concrete.	here is

#### Element Data

Element Group:	Barriers		Length:	4.88 m			
Element Name:	Barrier/Parapet	Walls	Width:				
Location:			Height:		0.	.81 m	
Material:	Concrete		Count:			2	
Element Type:			Total Quantity:		7.	91 m <sup>2</sup>	
Environment:	Severe		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
Condition Data:	m <sup>2</sup>				7.91	Yes	
Comments:	The top concrete rail h section loss.	as observed	delamination, surfac	ce spalling,	and expose	ed reinforcing s	teel with
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent Remove and replace the barrier and add approach barrier protection to meet current code requirements.							

Element Group:	Barriers		Length:		0.16 m				
Element Name:	Posts		Width:	0.16 m					
Location:			Height:		0	.81 m			
Material:	Concrete		Count:			22			
Element Type:			Total Quantity:			22			
Environment:	Severe		Limited Insp'n:						
Protection System:									
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	each				22	Yes			
Comments:         Severe surface spalling and exposed rebar was observed at the post bases. Loose connection between posts and deck. Nine interior posts are broken off and missing.									
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent Remove and replace with new barrier and add approach barrier protection to meet current code requirements.									

Structure: 4

Element Group:	Abutments		Length:							
Element Name:	Abutment W	alls	Width:	5.69 m						
Location:			Height:		1.	.22 m				
Material:	Concrete		Count:			2				
Element Type:			Total Quantity:		6.	94 m <sup>2</sup>				
Environment:	Moderate	•	Limited Insp'n:							
Protection System:										
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs			
	m <sup>2</sup>				6.94	Yes	Yes			
Comments: Surface cracking & severe spalling were observed on each abutment wall.										
Recommended Wor	r <b>k:</b> None Remove all poor concr	6-10 Years ete, clean the	1-5 Years e reinforcing steel, a	< 1 Year nd replace of	Urgent concrete.					

### Element Data

Element Group:	Abutments		Length:		1.83 m			
Element Name:	Wingwalls	3	Width:		1.22 m			
Location:			Height:					
Material:	Concrete		Count:			4		
Element Type:			Total Quantity:		8.	.93 m <sup>2</sup>		
Environment:	Moderate	)	Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
Protection System: Condition Data: Comments:	m <sup>2</sup>			3.57	5.36	Yes	Yes	
Comments: Recommended Wor	Severe surface spalling rk: None Remove all poor concr	3, cracking, 6-10 Years ete, clean th	and section loss at to 3 1-5 Years 1e reinforcing steel, a	p of footing	were obse	rved.		

Element Group:	Foundation	าร	Length:					
Element Name:	Foundation (below ground level)		Width:					
Location:			Height:	7.52				
Material:	Concrete		Count:			2		
Element Type:			Total Quantity:					
Environment:	Moderate		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
						Yes		
Comments:	Limited inspection due under water with obser	to soil cover ved scaling a	and water level; how and delamination of	wever, the to concrete.	op of footing	gs are visibly ex	posed and	
Recommended Wo	rk: None Remove all poor concr	6-10 Years ete, clean the	1-5 Years e reinforcing steel, a	<pre> &lt; 1 Year     nd replace d</pre>	Urgent concrete.			

Structure: 4

Element Group:	Embankment	s & Streams	Length:				
Element Name:	Streams and	Waterways	Width:				
Location:		Н					
Material:	Earth / Stone	e / Bedrock	Count:				
Element Type:			Total Quantity:				
Environment:	Mode	rate	Limited Insp'n:				
Protection System:							
	Linite	Exe	Cood	Foir	Poor	Perform.	Maint.
Condition Data:	Onits	EXC.	9000	Fall	FUUI	Deficienci	Needs
				All		Yes	Yes
Comments:	Scour at southeast con	ner and debris buil	dup at northeast co	rner.			
				_			
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent		
	Place rock protection a	and clear debris bui	ldup.				

#### Element Data

Element Group:	Embankment	Embankments & Streams					
Element Name:	Embank	Embankments					
Location:			Height:				
Material:	Earth /	Stone	Count:	4			
Element Type:			Total Quantity:	4			
Environment:	Mode	Moderate					
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficienci	Maint. Needs
	Each			4			
Comments:	Stone / Earth vegetate	d embankments a	re generally stable, v	with some n	ninor bank	erosion obse	erved.
Recommended Work:	None Place rip rap erosion p	6-10 Years rotection.	1-5 Years	< 1 Year	Urgent		

Element Group:	Signs		Length:				
Element Name:	Signs		Width:				
Location:			Height:				
Material:	Ste	el	Count:	10			
Element Type:			Total Quantity:		,	10	
Environment:	Mode	rate	Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficienci	Maint. Needs
	Each		10				
Comments: Recommended Work:	Two (2) load limit, two signs are in place. End None Maintain, straighten ar	(2) narrow structure, I hazard signs are no 6-10 Years Id align all signage w	two (2) 35 km/hr ot properly secure 1-5 Years vith traffic.	speed limit and are no	signs and fo ot plumb. ] Urgent	our (4) end h	iazard

Structure:	4

Element Group:	Approac	hes	Length:			5 m		
Element Name:	Wearing S	Wearing Surface		3.96 m				
Location:			Height:					
Material:	Grave	el	Count:		2			
Element Type:			Total Quantity:		39	9.6 m <sup>2</sup>		
Environment:	Modera	ate	Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>			39.6			Yes	
Comments:								
Recommended Work: None 6-10 Years Grade approach and structure wearing		1-5 Years surfaces annually.	< 1 Year	Urgent				

Element Group:	Approac	hes	Length:				
Element Name:	Draina	ge	Width:				
Location:			Height:				
Material:	Earth/Gr	avel	Count:				
Element Type:			Total Quantity:				
Environment:	Modera	ate	Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%			100		Yes	Yes
Comments:	Shoulders heavy vege	tated with grass li	kely impeding drair	nage.			
Recommended Wo	r <b>k:</b> None Clear vegetation off sh	6-10 Years oulders to achiev	1-5 Years e proper drainage.	< 1 Year	Urgent		



Photo 4-2: View of east structure elevation, wingwalls, exterior curb and barrier



Photo 4-3: View of soffit and abutment wall



Photo 4-4: View of soffit



Photo 4-5: View of wearing surface



Photo 4-6: View of southeast wingwall



Photo 4-7: View of west structure elevation, exterior soffit, curb and barrier



Photo 4-8: View of watercourse upstream



Photo 4-9: View of watercourse downstream

# **Bridge/Culvert Inspection Report**

Site Number	5	Project Number	CA0043256.3165
Structure Name	Stokes Bay Road/Copper Kettle Bridge	Municipality	Northern Bruce Peninsula
MTO Region Code	30	County	Bruce Code 02
MTO District Code	33	Geographic Twp Code	377



wsp

1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

## Bridge/Culvert Inspection Report

#### **Inventory Data**

Structure Name	Stokes Bay Road Bridge	Site Number	5
County	Bruce	Road Name	Stokes Bay Road
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.
Bridge or Culvert	Bridge	Owner	Northern Bruce Peninsula
Structure Type	Concrete - Rigid Frame	AADT	400
Span (m)	7.9 No. 1	% Trucks	10%
Height (m)	2		
Direction of Structure	East/West - 22° skew	Overall Structure Width (m)	10.7
Year Built/Rehabilitated	1950/1988	Roadway Width (m)	7.9
Current Load Limit	None	Total Deck Length (m)	7.9
Detour Length (km)	27	Total Deck Area (s.m.)	84.5
Waterway	Stokes River	Heritage Des.	None
Inspection Data			
Date of Inspection	October 31, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	5-1: Title Page 5-2: View of south structure el	evation and streambed
Equipment Used	Tape, pick, hammer	5-3: View of north structure ele 5-4: View of south barriers	evation and streambed
Weather Conditions	Sun & Cloud	5-6: View of barrier post rot (ty	yp.)
Temperature	20°C	5-7: View of pedestrian barrier 5-8: View of southwest emban	post rot kment erosion
Last Inspection	December 7, 2022	<ul><li>5-9: View of northwest wingw</li><li>5-10: View of structure soffit</li><li>5-11: View of abutment wall</li><li>5-12: View of watercourse ups</li><li>5-13: View of watercourse ups</li></ul>	all and embankment tream tream
Additional Investigation		None	
Required			
Total Rehabilitation	Upgrade structure approach and barrier p Complete concrete repairs. Repair existin	protection to code. Upgrade pedes ng and place additional erosion pr	trian barrier protection to code. otection.
Total Rehabilitation Budget Costing	\$175,000	Next Inspection	October 2026
Justification	Repair & rehabilitation recommended du approach protection and replace vehicle	te to current good condition of str and pedestrian barrier protection t	ucture to extend service life. Install user safety.

Structure:	5

Element Group:	Decks		Length:		7.4 m			
Element Name:	Wearing Surface		Width:		8.5 m			
Location:			Height:					
Material:	Aspha	lt	Count:					
Element Type:			Total Quantity:		6	2.9 m <sup>2</sup>		
Environment:	Sever	Severe						
Protection System:			None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m²		62.9					
Four (4) end hazard s								
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent			

#### Element Data

Element Group:	Decks	Decks			7.4 m				
Element Name:	Deck To	Deck Top			11.5 m				
Location:			Height:						
Material:	Concret	ie	Count:						
Element Type:			Total Quantity:		85	5.1 m <sup>2</sup>			
Environment:	Benigr	1	Limited Insp'n:						
Protection System:			Wearing Sur	face					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	m <sup>2</sup>			85.1					
Comments: Recommended Work:	Limited inspection due surface and soffit.	to wearing surfa 6-10 Years	ace cover. Fair cond	ition assumed	l based on d	condition of we	aring		

Element Group:	Decks		Length:		7	'.9 m	
Element Name:	Soffit - Thic	< Slab	Width:	10.7 m			
Location:			Height:				
Material:	Concrete		Count:				
Element Type:			Total Quantity:		84	.53 m <sup>2</sup>	
Environment:	Benigr	1	Limited Insp'n:				
Protection System:			None	None			
	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	m²		59.17	17.02	8.45	Yes	Yes
Comments:	Minor cracking and hor construction cold joint joint. Localized severe the mid-span joint.	neycombing obse extension sectior spalling of concr	erved at the base of the base of the seepage and seven rete and exposed rebains and exposed rebains and exposed rebains and exposed rebains and seven rebain	he haunch a re effloresce ar showing s	t the constr ence observ significant c	ruction joint and red at the mid-s orrosion obser	d the span cold ved near
Recommended Work:	: None Complete concrete rep	6-10 Years air at the mid-sp	1-5 Years an cold joint.	< 1 Year	Urgent		

Structure: 5

Element Group:	Barrier		Length:		3.85 m			
Element Name:	Railing Sys	tem	Width:					
Location:	Each Side		Height:					
Material:	Steel/Woo	od	Count:			16		
Element Type:	Flex Beam/F	Post	Total Quantity:		61	.6 m		
Environment:	Severe		Limited Insp'n:					
Protection System:			Galvaniz	ed				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m			30.8	30.8	Yes	Yes	
Four (4) end hazard	The steel flex beam has signs of moderate to s configuration of the en also showing signs of	The steel flex beam has observed impact damage at the approaches. The wooden posts are show signs of moderate to severe rot. A number of posts are no longer connected to the beams. The configuration of the end treatments does not meet current code. The wooded pedestrian barricade also showing signs of rot, and does not meet code.				e showing The Irricade is		
Recommended Worl	k: None Replace vehicle and p	6-10 Years edestrian barri	1-5 Years ers to code.	< 1 Year	Urgent			

#### Element Data

Element Group:	Abutments		Length:		1.52 m			
Element Name:	Abutment W	alls	Width:	10.7 m				
Location:	Each Side		Height:					
Material:	Concrete	9	Count:			2		
Element Type:			Total Quantity:		32.	53 m <sup>2</sup>		
Environment:	Moderate	9	Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>		26.02	6.51				
Comments: Recommended Wor	Hairline cracks and ho throughout showing se	neycombing o epage water s 6-10 Years	bserved at the hau staining. 1-5 Years	unches. Ver < 1 Year	tical hairlin Urgent	e cracks obse	rved	

Element Group:	Abutment	S	Length:		1.55 m			
Element Name:	Wingwall	S	Width:	1.57 m				
Location:			Height:					
Material:	Concrete	;	Count:			4		
Element Type:			Total Quantity:		9.1	74 m <sup>2</sup>		
Environment:	Moderate	;	Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>		3.2	4.6	1.94		Yes	
Comments:	Hairline cracks with eff Erosion/undercutting o wall.	lorescence, m bserved unde	ninor spalling, and r the north walls. [	honeycomb Damage obs	bing observ served at th	ed throughout he base of the	southwest	
Recommended Wor	k: None Remove all poor concr and pour concrete at th	6-10 Years ete, clean reir ne base of the	1-5 Years forcing steel, and north walls to pre	< 1 Year replace cor vent further	Urgent ncrete. Plac undercuttir	ce rock protect	ion or form	

Structure:	5

Element Group:	Foundations		Length:				
Element Name:	Foundation (below ground level)		Width:				
Location:	Each En	d	Height:				
Material:	Concret	е	Count:				
Element Type:			Total Quantity:				
Environment:	Moderat	e	Limited Insp'n:			Yes	
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
Four (4) end hazard	Not visible for inspection	on, however the	structure appears	stable and	is founded	on bedrock.	
Recommended Work	c: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Embankments & Streams		Length:				
Element Name:	Streams and Wa	aterways	Width:				
Location:			Height:				
Material:	Bedrock	(	Count:				
Element Type:			Total Quantity:			All	
Environment:	Moderat	e	Limited Insp'n:				
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	All			All			
Comments:	No signs of impedance	e to flow. Scour	r was observed arc	ound the cor	ncrete at the	e north inlet.	
Recommended Work	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Embankments & Streams		Length:				
Element Name:	Embankme	ents	Width:				
Location:	Each Corner		Height:				
Material:	Stone/Ea	Stone/Earth					
Element Type:			Total Quantity:			4	
Environment:	Moderate Limited Insp'n:		Limited Insp'n:				
Protection System:	None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each			2	4	Yes	Yes
Comments:	<b>Ints:</b> Vegetated with rock protection. Slopes showing signs of erosion and shifting of rock protection. Scour observed at the inlet (north side).					. Scour	
Recommended Worl	k: None Reposition existing/pla voids between large ro	6-10 Years ce additional ro cks to prevent	1-5 Years ock protection to pr additional erosion.	< 1 Year event slope	Urgent failure and	additional scou	ır. Fill

Structure: 5

	Signs		Lenath:				
Element Name:	Signs		Width:				
Location:	Each Corner		Height:				
Material:	Steel	Steel					
Element Type:			Total Quantity:			4	
Environment:	Severe		Limited Insp'n:				
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each		4				
Comments:	Four (4) end hazard si	gns in place a	na in good conditio	on.			
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		
					orgoni		
Element Data					orgoni		
Element Data	Approach	es	Length:		orgoni	5 m	
Element Data Element Group: Element Name:	Approach Wearing Su	es rface	Length: Width:			5 m 8.5 m	
Element Data Element Group: Element Name: Location:	Approach Wearing Su Each En	<mark>es</mark> fface d	Length: Width: Height:			5 m 8.5 m	
Element Data Element Group: Element Name: Location: Material:	Approach Wearing Su Each En Asphalt	es rface d	Length: Width: Height: Count:			5 m 8.5 m 2	
Element Data Element Group: Element Name: Location: Material: Element Type:	Approach Wearing Su Each En Asphalt	es rface d	Length: Width: Height: Count: Total Quantity:			5 m 8.5 m 2 85 m <sup>2</sup>	
Element Data Element Group: Element Name: Location: Material: Element Type: Environment:	Approach Wearing Sur Each En Asphalt Severe	es rface d	Length: Width: Height: Count: Total Quantity: Limited Insp'n:			5 m 8.5 m 2 85 m <sup>2</sup>	
Element Data Element Group: Element Name: Location: Material: Element Type: Environment: Protection System:	Approach Wearing Sur Each En Asphalt Severe	es rface d	Length: Width: Height: Count: Total Quantity: Limited Insp'n: None			5 m 8.5 m 2 85 m <sup>2</sup>	

 m<sup>2</sup>
 75
 10

 Comments:
 The approach wearing surface is generally in good condition. Minor to moderate transverse cracking observed at the limit of each approach.

Recommended Work: None	6-10 Years	1-5 Years	< 1 Year	Urgent
------------------------	------------	-----------	----------	--------



Photo 5-2: View of south structure elevation and streambed



Photo 5-3: View of north structure elevation and streambed



Photo 5-4: View of south barriers



Photo 5-5: View of north barrier



Photo 5-6: Wooden structure barrier post rot (typ.)



Photo 5-7: Wooded pedestrian barrier post rot



Photo 5-8: View of southwest embankment erosion



Photo 5-9: View of northwest wingwall and embankment



Photo 5-10: View of structure soffit



Photo 5-11: View of abutment wall



Photo 5-12: View of watercourse upstream



Photo 5-13: View of watercourse downstream

# **Bridge/Culvert Inspection Report**

Site Number	6	Project Number	CA0043256.3165		65
Structure Name	Heron Point Road Bridge	Municipality	Northern Bru	ce Penins	ula
MTO Region Code	30	County	Bruce	Code	02
MTO District Code	33	Geographic Twp Code	377		





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

### Bridge/Culvert Inspection Report

Inventory Data			
Structure Name	Heron Point Road Bridge	Site Number	6
County	Bruce	Road Name	Heron Point Road
Municipality	Northern Bruce Peninsula	Road Type	Rural Local
Bridge or Culvert	Bridge	Owner	Northern Bruce Peninsula
Structure Type	Rigid Frame	AADT	200
Span (m)	7.1 No. 1	% Trucks	10%
Height (m)	2.5		
Direction of Structure	East/West - 15° skew	Overall Structure Width (m)	8.1
Year Built/Rehabilitated	1952	Roadway Width (m)	5.9
Current Load Limit	12 t	Total Deck Length (m)	8.3
Detour Length (km)	N/A - Dead Ends	Total Deck Area (s.m.)	67.2
Waterway	Stokes River	Heritage Des.	None
Inspection Data	_		
Date of Inspection	October 31, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	6-1: Title Page 6-2: View of north approach,	wearing surface, curb and walls
Equipment Used	Tape, pick, hammer	6-3: View of deack wearing su 6-4: View of west elevation, si	Irface from south approach lope protection and parapet wall
Weather Conditions	Overcast	6-5: View of east elevation, at 6-6: View of north flex beem a	butment wall and rock protection and wooden post barrier (typ.)
Temperature	20°C	6-7: View of south cable and v 6-8: View of interior soffit, ha	wooden post barrier (typ.) unch and upper abutment wall
Last Inspection	December 7, 2022	6-9: View of upper and lower 6-10: View of lower abutment 6-11: View or northeast wingy 6-12: View of scour behind so 6-13: View of southwest wing 6-14: View of watercourse do 6-15: View of watercourse upp	abutment walls wall separation from upper wall wall cracking and separation uth abutment wall wingwall / abutment wall scour wnstream stream
Additional Investigations Required	If the structure is to remain in service, a should be completed. In the interim, con and footing separation/scour frequently.	detailed investigation of the sub- plete annual inspections and mo	structure and load limit analysis nitor the condition of the wingwalls
Total Rehabilitation	Replacement or closure recommended as	s rehabilitation is no longer econo	omically feasible.
Total Rehabilitation Budget Costing	\$300,000	Next Inspection	October 2026
Justification	Due to the poor overall condition of the permanent closure of the structure be co completed, a detailed structural evaluation to confirm the extend of the repairs required until approach barrier is upgraded.	wingwalls and footings, it is recompleted. If the structure is to ren on and load carrying capacity and ired and the safe load limit. Mai	ommended that replacement or nain open and rehabilitation alysis should be completed in order intain the speed limit of 20 km/hr

Page 2

Structure: 6

Element Group:	Decks		Length:		8	.05 m		
Element Name:	Deck Top	)	Width:	5.9 m				
Location:			Height:					
Material:	Concrete	Count:						
Element Type:			Total Quantity:	Quantity: 47.5 m <sup>2</sup>				
Environment:	Severe Limited Insp'n:							
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>			35.6	11.9	Yes	Yes	
Comments:	The deck has mild to s relatively flat allowing	ever spalling water to pond	, popouts and snow I.	plow dama	ge. The de	ck appears to b	)e	
Recommended Wor	r <b>k:</b> None Repair all poor and de surface graded to achi	6-10 Years laminated con	1-5 Years ncrete, waterproof th rainage.	< 1 Year ne structure	Urgent deck, and	place an asph	alt wearing	

#### Element Data

Element Group:	Decks		Length:		7.	41 m	
Element Name:	Soffit - Thick	Slab	Width:	6.8 m			
Location:			Height:				
Material:	Concrete	•	Count:				
Element Type:			Total Quantity:	50.39 m <sup>2</sup>			
Environment:	Moderate	9	Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	m²			30.23 20.16 Yes		Yes	Yes
Comments:	Observed spalling, cracking, honeycombing and stain modorate on the interior soffit, moderate to severe at centre of the sofit along the full length of the span.				escence of and exterio	f the soffit. Mir or soffit. Crack	nor to near
Recommended Wor	k: None Remove all poor conci	6-10 Years rete, clean reii	1-5 Years nforcing steel and re	< 1 Year eplace conc	Urgent rete.		

Element Group:	Decks		Length:				
Element Name:	Drainage		Width:				
Location:			Height:				
Material:	Concrete		Count:				
Element Type:			Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
						Yes	Yes
Comments:	There are currently no	deck drains ir	n place and the grad	de is relative	ely flat allow	ving for water	ponding.
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent	halt waaring a	urfooo
	graded to achieve pos	itive drainage.	place a waterproofil	ng membrai	ne and asp	nait wearing s	unace

Structure: 6

Element Group:	Sidewalks/c	urbs	Length:		8.05			
Element Name:	Curbs		Width:	0.21				
Location:			Height:			0.21		
Material:	Concrete	Э	Count:			2		
Element Type:			Total Quantity:		6.	76 m <sup>2</sup>		
Environment:	Severe		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>			4.98	1.69			
Comments:	Minor spalling observe Ends of curb are chipp	ed throughout bed from snov	. Severe spalling obse v removal.	erved at the	northeast c	orner with expo	osed rebar.	
Recommended Worl	k: None Remove all poor conc	6-10 Years rete, clean rei	1-5 Years inforcing steel, and rep	< 1 Year	Urgent ete.			

#### Element Data

Element Group:	Barriers		Length:			8.05	
Element Name:	Barrier/Parapet	Walls	Width:	0.15			
Location:			Height:			1.15	
Material:	Concrete		Count:			2	
Element Type:					18	8.52 m <sup>2</sup>	
Environment:	Severe		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	m <sup>2</sup>			16.67	1.85		
Comments: Recommended Work	Minor to moderate spa c: None Remove all poor concr	Iling and hair 6-10 Years rete, clean re	rline cracks observed t 1-5 Years inforcing steel, and rep	hroughout. I < 1 Year blace concre	Damage (c Urgent ete.	hipping) at corn	ers.

Element Group:	Abutment	S	Length:					
Element Name:	Abutment W	alls	Width:		7.8			
Location:			Height:		0.64			
Material:	Concrete		Count:			2		
Element Type:	-		Total Quantity:		9.98 m <sup>2</sup>			
Environment:	Moderate	;	Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m²			8.98	1			
Comments:	Surface cracking & mir	nor spalling c	bserved throughout t	he abutment	walls.			
	Remove all poor concr	ete, clean re	inforcing steel, and re	eplace concre	ete.			

Structure: 6

Element Group:	Abutmen	ts	Length:					
Element Name:	Wingwall	S	Width:	3.05				
Location:			Height:	0.6				
Material:	Concrete	Э	Count:	2				
Element Type:			Total Quantity:	Quantity: 1.83 m <sup>2</sup>				
Environment:	Moderate	Э	Limited Insp'n:	n:				
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>				1.83	Yes		
Comments:	The northeast wingwa scour was observed b severely cracked and	he northeast wingwall previously failed and was replaced with rock protection; however, severe scour was observed behind the rock protection and abutment wall/footing. The northwest wingwall i severely cracked and separating from the abutment wall connection.						
Recommended Wo	<b>fork:</b> None 6-10 Years 1-5 Years < 1 Year Urgent Monitor inlet conditions frequently. Replace wingwalls or place rock protection to prevent further scour/undercutting of abutment wall/footings.						ırther	

#### Element Data

Element Group:	Foundation	ns	Length:				
Element Name:	Foundation (below g	round level)	Width:	9.5			
Location:		Height:		(	).85		
Material:	Concrete	9	Count:			2	
Element Type:			Total Quantity:		1	6.15	
Environment:	Moderate	9	Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	m²				16.15	Yes	
Comments:	Footings are exhibiting longitudinally through allowing water to flow structure. Concrete be	Footings are exhibiting severe spalling and delamination. Both footings are severely split ongitudinally throughout, and are separating from the abutment walls. Damaged inlet wingwalls allowing water to flow through cracked sections causing concrete erosion and undermining the structure. Concrete between separation is very soft and unstable.					<i>w</i> alls the
Recommended Wo	Nork: None 6-10 Years 1-5 Years < 1 Year Urgent Replace wingwalls and repair damaged/undermined footings to prevent further erosion and comp loss of structure stability.					complete	

#### Element Data

L

Element Group:	Embankments &	Streams	Length:				
Element Name:	Streams and Wa	terways	Width:				
Location:			Height:				
Material:	Earth / Stone /	Rock	Count:				
Element Type:			Total Quantity:				
Environment:	Moderate	9	Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	All			All			
Comments:	Bedrock streambed is	stable and fre	e of obstruction at	t the time of	inspection	l.	
Recommended Wor	<b>'k:</b> None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Embankments	& Streams	Length:				
Element Name:	Embankn	nents	Width:				
Location:			Height:				
Material:	Earth / Rock		Count:			4	
Element Type:			Total Quantity:			4	
Environment:	Modera	ate	Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each			4			
Comments:	The embankments are erosion observed at th rock protection was ob the failure of the struct	a combination of e structure inlet a served. New rip r ure wingwall. (See	rock and vegeta nd outlet. Some o ap placed in 2017 e wingwall notes)	ted earth ar corner erosi 7 to protect	nd appear g on and set the emban	generally stabl tlement of the kment expose	e with existing d following
Recommended Worl	k: None Place rip-rap and/or ro	6-10 Years ck protection.	1-5 Years	< 1 Year	Urgent		

Element Group:	Signe	5	Length:				
Element Name:	Signe	5	Width:				
Location:			Height:				
Material:	Stee	Ī	Count:				
Element Type:			Total Quantity:			10	
Environment:	Modera	ate	Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each		10				
Comments: Recommended Worl	Two (2) 12t load limit s end hazard signs all in k: None	igns, two (2) narro place and in good 6-10 Years	ow structure, two d condition. 1-5 Years	(2) 20 km/ł < 1 Year	nr speed lin Urgent	nit signs and fo	our (4)

Element Group:	Approac	hes	Length:		Ę	5 m	
Element Name:	Wearing S	urface	Width:	5.9 m			
Location:			Height:	ht:			
Material:	Asphalt / Gravel		Count:	2			
Element Type:			Total Quantity:	ity: 59 m <sup>2</sup>			
Environment:	Sever	е	Limited Insp'n:	p'n:			
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	m²			53.1	5.9		Yes
Comments:	The north approach is abutment wall indicatin condition.	asphalt showing r ig settlement or so	ninor stress crac cour at the joint.	king, and ar The south a	n asphalt pa pproach is	atch at the nor a gravel surfa	th ce in fair
Recommended Work:         None         6-10 Years         1-5 Years         < 1 Year         Urgent           Pave the south approach to reduce maintenance and improve drainage. In the interim, continue a grading of the approach wearing surface and shoulders.         Image: Content of the interim of the interimod of the interim of the interim of the interim of the i							ue annual

Element Group:	Approaches		Length:								
Element Name:	Drainage		Width:								
Location:			Height:								
Material:	Asphalt / Gravel		Count:								
Element Type:			Total Quantity:								
Environment:	Severe		Limited Insp'n:								
Protection System:											
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs				
	%			50	50	Yes					
<b>Comments:</b> Heavily vegetated shoulders with gravel build up likely impeding proper drainage.											
Recommended Work: None 6-10 Years <u>1-5 Years</u> < 1 Year Urgent Grade shoulders to improve drainage.											

Element Group:	Approaches		Length:							
Element Name:	Guiderail		Width:							
Location:			Height:							
Material:	Steel/Timber		Count:							
Element Type:	3 - Cable and Flex Beam		Total Quantity:							
Environment:	Severe		Limited Insp'n:							
Protection System:	Galvanized									
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform.	Maint.			
						Deficiencies	Needs			
	%			25	75	Yes	Yes			
Comments:The configuration of the flex beam on the north side of the structure does not meet Code. There are missing intermediate posts, improper connections to the structure parapet walls, and lack end protection. The 3-cable guiderail on the south approach is set too high, the cable is loose, several posts are broken, and the structure connection is not to code.										
Recommended Work:         None         6-10 Years         1-5 Years         < 1 Year         Urgent           Upgrade the north approach barrier protection and structure connection to meet current code. Replace the 3-cable south side barrier with flex beam.         Image: Comparison of the structure connection is a structure connection in the structure connection is a structure connection.         Image: Comparison of the structure connection is a structure connection.         Image: Comparison of the structure connection is a structure connection.         Image: Comparison of the structure connection is a structure connection.         Image: Comparison of the structure connection is a structure connection.         Image: Comparison of the structure connection is a structure connection.         Image: Comparison of the structure connection is a structure connection.         Image: Comparison of the structur										



Photo 6-2: View of north approach, deck wearing surface, curb and parapet walls



Photo 6-3: View of deack wearing surface from south approach



Photo 6-4: View of west structure elevation, slope protection and exterior of parapet wall



Photo 6-5: View of east structure elevation, south abutment wall and rock protection



Photo 6-6: View of north approach flex beem and wooden post barrier (typ.)



Photo 6-7: View of south approach cable and wooden post barrier (typ.)



Photo 6-8: View of interior soffit, haunch and upper abutment wall



Photo 6-9: View of upper and lower abutment walls



Photo 6-10: View of lower abutment wall separation from upper wall



Photo 6-11: View or northeast wingwall cracking and separation from abutment wall


Photo 6-12: View of scour and exposed bar behind south abutment wall



Photo 6-13: View of southwest wing wingwall / abutment wall scour



Photo 6-14: View of watercourse downstream



Photo 6-15: View of watercourse upstream

Site Number	7	Project Number CA0043		3256.31	65
Structure Name	Lindsay Road 5 Culvert	Municipality	Northern Bruce Peninsula		
MTO Region Code	30	County	Bruce	Code	02
MTO District Code	33	Geographic Twp Code	377		





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

## **Inventory Data**

Structure Name	Lindsay Road 5 Culvert	Site Number	7				
County	Bruce	Road Name	Lindsay Road 5				
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.				
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula				
Structure Type	Rigid Frame	AADT	350				
Span (m)	7.3 No. 1	% Trucks	15%				
Height (m)	3.1	Overall Structure Width (m)	17.4				
Direction of Structure	North/South	Roadway Width (m)	6.1				
Year Built/Rehabilitated	1972	Total Deck Length (m)	8.4				
Current Load Limit	None	Total Deck Area (s.m.)	146				
Detour Length (km)	5.5	Heritage Des.	None				
Waterway	Stokes River						
Inspection Data							
Date of Inspection	October 30, 2024	Photos:					
Name of Inspector	Evan Montreuil, P.Eng.	1-1: TitlePage 7-2: View of watercourse ups	tream				
Equipment Used	Tape, pick, hammer	7-3: View of watercourse dow 7-4: View of structure elevation	vnstream and culvert end				
Weather Conditions	Sun & Cloud	<ul><li>7-5: View of wearing surface</li><li>7-6: View of abutment wall (t</li></ul>	ур.)				
Temperature	20°C	7-7: View of soffit and abutm	ent wall				
Last Inspection	September 24, 2022						
Additional Investigation		None					
Required							
Total Rehabilitation	Install approach & barrier protection t Repair bank erosion.	o Code. Repair soffit concrete. Se	al the abutment cold joints.				
Total Rehabilitation Budget Costing	\$75,000	Next Inspection	October 2026				
Justification       The structure is in overall good condition. Construction of approach & barrier protection is justified for public safety and to meet code. Reduce the speed to 45 km/hr. until barrier protection is installed. Install end hazard signs to provide required vehicle safety.							

Structure:	7

Element Group:	Decks		Length:				
Element Name:	Wearing Sur	ace	Width:				
Location:							
Material:	Surface Treat	ment	Count:				
Element Type:			Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:			Non	e			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%	75	15	10			
Comments:	Slight settlement was of	observed.					
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Decks		Length:				
Element Name:	Deck Top	L. C.	Width:				
Location:			Height:				
Material:	Concrete		Count:				
Element Type:			Total Quantity:				
Environment:	Benign		Limited Insp'n:			Yes	
Protection System:			Wearing S	Surface			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		95	5			
Comments:	The visible ends are in	overall good	condition with son	ne minor spa	alling.		
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Decks		Length:				
Element Name:	Soffit - Thick	Slab	Width:				
Location:			Height:				
Material:	Concrete		Count:				
Element Type:			Total Quantity:				
Environment:	Benign		Limited Insp'n:				
Protection System:			Non	e			
	Units	Exc	Good	Fair	Poor	Perform.	Maint.
Condition Data:	Offits	2.40.	0000	i an	1 001	Deficiencies	Needs
	%		95		5		
Comments:	Honeycombing and ex	posed reinfor	cing steel observe	d at north e	nd.		
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Abutment	S	Length:				
Element Name:	Abutment W	alls	Width:				
Location:	Each Side		Height:				
Material:	Concrete	)	Count:				
Element Type:			Total Quantity:				
Environment:	Moderate	<u>}</u>	Limited Insp'n:				
Protection System:			•				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		80	20			
Comments: Recommended Wo	Hairline cracks at cold Transverse cracking at Minor spalling erosion ork: None [ Concrete repairs, seal	joint in haund cold joint, 1/ from high wa 6-10 Years cold joint.	ches and some spa 3 way up from footi ter level down to fo 1-5 Years	lling (honey ng on each oting. < 1 Year	comb) on v side. Urgent	valls.	

#### Element Data

Element Group:	Foundations		Length:				
Element Name:	Foundation (below g	round level)	Width:				
Location:	Each End		Height:				
Material:	Concrete		Count:				
Element Type:			Total Quantity:				
Environment:	Moderate		Limited Insp'n:			Yes	
Protection System:		None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
Comments: Recommended Wo	The foundations are no	ot visible, but t 6-10 Years	he structure appe 1-5 Years	ars stable. < 1 Year	Urgent		

Element Group:	Embankments &	Streams	Length:				
Element Name:	Streams and Wa	aterways	Width:				
Location:			Height:				
Material:	Earth / Rock		Count:				
Element Type:			Total Quantity:				
Environment:	Moderate		Limited Insp'n:				
Protection System:		None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:	No signs of impedance	e to flow at the	time of inspection.	. Medium v	elocity wate	ercourse.	
Recommended Wo	ork: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Structure:	7

Element Group:	Embankments &	Streams	Length:					
Element Name:	Embankmer	nts	Width:					
Location:	Each Corn	er	Height:					
Material:	Earth / Rock		Count:		4			
Element Type:			Total Quantity			4		
Environment:	Moderate Limited In:							
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each			4		Yes	Yes	
Comments: The embankments are heavily vegetated with rip rap protection on the slopes. The slopes are very steep, some moderate erosion observed.						es are		
Recommended work	Repair slope erosion p	rotection.	1-5 16415		Olgeni			

#### Element Data

Element Group:	Signs		Length:				
Element Name:	Signs		Width:				
Location:	Each Corn	er	Height:				
Material:			Count:				
Element Type:			Total Quantity				
Environment:	Severe		Limited Insp'n:				
Protection System:			Non	е			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each					Yes	
Comments:	No end hazard signs a	t structure.					
Recommended Work	<b>c:</b> None Install four end hazard	6-10 Years signs to prov	1-5 Years /ide required ve	< 1 Year hicle safety.	Urgent		

Element Group:	Approache	S	Length:						
Element Name:	Wearing Surf	ace	Width:						
Location:	Each End	1	Height:						
Material:	Asphalt		Count:						
Element Type:									
Environment:	Severe	Severe Limited Insp'n:							
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
Environment: Protection System: Condition Data: Comments:	%		70	25	5				
Comments: Recommended Work	Slight settlement was o eastbound lane. Transv :: None [ Repair road base prior	bserved at th verse crack 5 6-10 Years to next sche	he deck ends. A im east of deck ] 1-5 Years duled road resu	uligator crac · < 1 Year urfacing.	king obser: Urgent	ved along edge	e of		



Photo 7-2: View of watercourse upstream



Photo 7-3: View of watercourse downstream and downstream culvert end

Date of Photos: Dec. 6, 2022



Photo 7-4: View of structure Eelevation



Photo 7-5: View of wearing surface

Date of Photos: Dec. 6, 2022



Photo 7-6: View of abutment wall (typ.)



Photo 7-7: View of soffit and abutment wall

Date of Photos: Dec. 6, 2022

Site Number

8

**Project Number** 

CA0043256.3165

Structure Name

MTO Region Code

**MTO District Code** 

sthmus Bay Road Bridge	
30	
33	

Municipality

County

Geographic Twp Code

Northern Brue	ce Penins	sula
Bruce	Code	02
	377	



wsp

1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

Structure Name	Isthmus Bay Road Bridge	Site Number	8
Structure Walle	Isumus Day Road Druge	Site Number	0
County	Bruce	Road Name	Isthmus Bay Road
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.
Bridge or Culvert	Bridge	Owner	Northern Bruce Peninsula
Structure Type	Concrete Slab	AADT	350
Span (m)	6.1 No. 1	% Trucks	10%
Height (m)	1.5	Overall Structure Width (m)	9.9
Direction of Structure	East/West	Roadway Width (m)	7.3
Year Built/Rehabilitated	1950/2023	Total Deck Length (m)	7.3
Current Load Limit	None	Total Deck Area (s.m.)	72
Detour Length (km)	14	Heritage Des.	None
Waterway	Swan Lake Drain		
Inspection Data			
Date of Inspection	October 30, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	8-1: Title Page 8-2: View of structure and appr	roach barrier protection
Equipment Used	Tape, pick, hammer	8-5: View of wearing surface 8-4: View of concrete spillway.	/slope protection
Weather Conditions	Sun and Cloud	8-5: View of abuthlent wall (ty 8-6: View of soffit, abutment v	yalls and watercourse
Temperature	20°C	8-8: View of east foundation/w	ringwall concrete repairs
Last Inspection	December 6, 2022	8-9! View of sorrit cracking wi 8-10: View of watercourse ups 8-11: View of watercourse dow	th efflorescence tream /nstream
Additional Investigation Required			
Total Rehabilitation			
Total Rehabilitation Budget Costing		Next Inspection	October 2026
Justification	Rehabilitation completed in 2023. St	tructure is in good condition.	

#### **Inventory Data**

Structure: 8

Element Group:	Decks		Length:			7.3	
Element Name:	Wearing Sur	face	Width:			7.3       6.4       46.72       Poor     Perform.       Deficiencies       Urgent	
Location:						7.3 6.4 46.72 Poor Perform. Ma Deficiencies Ner	
Material:	Asphalt		Count:			7.3 6.4 46.72 Poor Perform. Main Deficiencies Need	
Element Type:			Total Quantity:		2	16.72	
Environment:	Severe		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	m <sup>2</sup>		Width:       6.4         Height:       Count:         Total Quantity:       46.72         Limited Insp'n:       46.72         cc.       Good       Fair       Poor         Years       1-5 Years       < 1 Year				
Comments:	·						
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

### Element Data

Element Group:	Decks		Length:			7.3	·
Element Name:	Deck Top		Width:			7.3 9.4 68.62 Yes Poor Perform. Deficiencies Yes umed following recent re	
Location:			Height:				
Material:	Concrete	9	Count:				
Element Type:			Total Quantity:		6	68.62	
Environment:	Moderate	е	Limited Insp'n:			Yes	
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Deck Top       Width:       9.4         Height:	Yes					
Comments: Limited inspection du Recommended Wo	ue to surface treatment	wearing surfa	ice cover. Good o 1-5 Years	condition as < 1 Year	sumed folk	owing recent re	habilitation

Element Group:	Decks		Length:			10.3	
Element Name:	Soffit - Thick	Slab	Width:			10.3         6.1         62.83         Poor       Perform.         Deficiencies         on. Repairs completed in         Urgent	
Location:			Height:		10.3         6.1         62.83         Poor       Perform.         Deficiencies       N         ion. Repairs completed in 20         Urgent		
Material:	Concrete	Concrete			62.83 air Poor Perform. Mair Deficiencies Nee 28 er section. Repairs completed in 2023		
Element Type:			Total Quantity:		6	62.83	
Environment:			Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
			56.55	6.28			
Comments:	Minor cracking with eff	lorescence ob	served througho	ut older sec	tion. Repai	rs completed in	2023
Recommended Wo	appears to be in good rk: None	condition. 6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Decks		Length:				
Element Name:	Drainage	9	Width:				
Location:			Height:				
Material:	Concrete	;	Count:				
Element Type:			Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform.	Maint. Needs
Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data: Comments: Recommended Wor	%		100			Demoloriolog	Noodo
Comments:	Surface runoff directed	I to curbs w/ po	oured concrete sp	pillways to p	revent eros	ion.	
Recommended Wo	rk: None Clear the debris and g	6-10 Years ravel along the	1-5 Years curb to achieve	< 1 Year drainage.	Urgent		

## Element Data

L

Element Group:	Sidewalks/c	urbs	Length:			10.5	
Element Name:	Curbs		Width:			10.5 0.3 0.25 2 11.55 Poor Perform. Deficiencies	
Location:			Height:	Image: 10.3       0.3       0.25       2       11.55       Fair       Poor       Perform.       Deficiencies       1       2.89			
Material:	Concret	e	Count:			2	
Element Type:		-	Total Quantity:		1	11.55	
Environment:	Severe	<i>,</i>	Limited Insp'n:				
Protection System:		-					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
invironment: Protection System: Condition Data: Comments:	m <sup>2</sup>		8.66	2.89			
Comments:	Minor surface spalling	observed.				<u> </u>	
Recommended Wo	rk: None Remove all poor conci	6-10 Years rete, clean re	3 1-5 Years inforcing steel, and	< 1 Year replace co	Urgent Increte.		

#### Element Data

Element Group:	Barriers		Length:		1	10.5	
Element Name:	Railing Syst	ems	Width:				
Location:			Height:			10.5 2 21 Poor Perform. Mai Deficiencies Nee	
Material:	Steel		Count:			2	
Element Type:	Flex Bear	n	Total Quantity:			21	
Environment:			Limited Insp'n:	:			
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
			21			2 21 Perform. Deficiencies	
Comments:	New barrier installed in	1 2023.	-			· · · · · ·	
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Structure: 8

Element Group:	Barriers		Length:					
Element Name:	Posts		Width:			12 or Perform. Ma Deficiencies Ne Yes		
Location:			Height:					
Material:	Steel		Count:			12		
Element Type:	I-Beam		Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each	Posts       Width:         Height:       12         Steel       Count:       12         I-Beam       Total Quantity:         Severe       Limited Insp'n:         Units       Exc.       Good         Fair       Poor       Perform.         Deficiencies       N         Each       12       Yes         None       6-10 Years       1-5 Years       < 1 Year						
Comments: Recommended Work	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

#### Element Data

Element Group:	Abutment	S	Length:		10.3			
Element Name:	Abutment W	alls	Width:					
Location:			Height:	1.8				
Material:	Concrete		Count:	2				
Element Type:			Total Quantity:		37.08			
Environment:	Moderate	;	Limited Insp'n:	:				
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
Condition Data:	m <sup>2</sup>		18.54	18.54				
Comments:	Minor spalling and sur	ace cracking	observed through	nout.				
Recommended Worl	<b>c:</b> None Remove and replace a injection/filling.	6-10 Years Il poor concre	] 1-5 Years ete, clean reinforc	< 1 Year ing steel, a	Urgent nd replace	concrete. Comp	olete crack	

Element Group:	Abutment	S	Length:	2.1				
Element Name:	Wingwalls	6	Width:					
Location:			Height:			1.5		
Material:	Concrete		Count:			4		
Element Type:			Total Quantity:			12.6		
Environment:	Moderate L		Limited Insp'n:					
Protection System:								
Condition Data:		Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>		12.6					
Comments:	Wingwalls in good con	dition followir	ng 2023 concrete	repairs.				
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Structure: 8

Element Group:	Foundat	ons	Length:				
Element Name:	Founda	tion	Width:				
Location:			Height:				
Material:	Bedroo	:k	Count:				
Element Type:			Total Quantity:				
Environment:	Moderate		Limited Insp'n:	Yes			
Protection System:		t Corner					
	Units	Exc	Good	Fair	Poor	Perform.	Maint.
Condition Data:	01110	LX0.	0000	1 all	1 001	Deficiencies	Needs
	%		100				
Comments:	Concrete underpinning	complete in 2023	to eliminate scou	ır issue.			
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Embankments	& Streams	Length:					
Element Name:	Slope Prot	ection	Width:					
Location:								
Material:	Earth / Stone /	Concrete	Count:	6				
Element Type:			Total Quantity:		6			
Environment:	Moderate		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each		6					
Comments:       The slopes are well vegetated and appear stable. Concrete spillways/slope protection placed at each curb termination to reduce erosion.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								

Element Group:	Signs	3	Length:				
Element Name:	Signs		Width:				
Location:			Height:				
Material:	Steel		Count:			4	
Element Type:			Total Quantity:			4	
Environment:			Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
			4				
Comments:	Four end hazard signs	w/ guiderail end	markers are currer	ntly in place	and in goo	d condition.	
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Structure: 8

Element Group:	Approache	es	Length:		5			
Element Name:	Wearing Sur	face	Width:	7.3				
Location:			Height:					
Material:	Asphalt		Count:			2		
Element Type:			Total Quantity:		73			
Environment:	Severe		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m <sup>2</sup>		73					
Comments: Road recently paved and approaches are in good conditions.								
Recommended Wo	rk: None	6-10 Years	s 1-5 Years	< 1 Year	Urgent			

Element Group:	Approache	es	Length:				
Element Name:	Drainage	;	Width:				
Location:			Height:				
Material:	Asphalt		Count:				
Element Type:			Total Quantity:				
Environment:	Severe	Severe					
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		90				
Comments: Poor drainage along shoulders signs of water ponding observed.							
Recommended Wo	rk: None	6-10 Years	1-5 Years	] < 1 Year	Urgent		



Photo 8-2: View of structure and approach barrier protection



Photo 8-3: View of wearing surface



Photo 8-4: View of concrete spillway/slope protection



Photo 8-5: View of abutment wall (typ.)



Photo 8-6: View of soffit, abutment walls and watercourse



Photo 8-7: View of east structure elevation, wingwalls, exterior soffit and curb



Photo 8-8: View of east foundation/wingwall concrete repairs



Photo 8-9: View of soffit cracking with efflorescence



Photo 8-10: View of watercourse upstream



Photo 8-11: View of watercourse downstream

Site Number	9	Project Number	CA004	43256.31	65
Structure Name	Cape Chin Culvert	Municipality	Northern I	Bruce Per	iinsula
MTO Region Code	30	County	Bruce	Code	02
MTO District Code	33	Geographic Twp Code		377	





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

#### **Inventory Data**

Structure Name	Cape Chin Culvert	Site Number	09	
County	Bruce	Road Name	East Road	
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.	
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula	
Structure Type	Rigid Frame - Arch - Precast	AADT	350	
Span (m)	4.3 No. 1	% Trucks	15%	
Height (m)	1.8	Overall Structure Width (m)	15	
Direction of Structure	East/West - 20° skew	Roadway Width (m)	7.5	
Year Built/Rehabilitated	2008	Total Deck Length (m)	4.9	
Current Load Limit	None	Total Deck Area (s.m.)	68.6	
Detour Length (km)	32	Heritage Des.	None	
Waterway	Chin Creek			
Inspection Data				
Inspection Data Date of Inspection	October 30, 2024	Photos:		
Inspection Data Date of Inspection Name of Inspector	October 30, 2024 Evan Montreuil, P.Eng.	Photos: 9-1: Title Page 9-2: View of structure soffit, v	valls and foundation	
Inspection Data Date of Inspection Name of Inspector Equipment Used	October 30, 2024 Evan Montreuil, P.Eng. Tape	Photos: 9-1: Title Page 9-2: View of structure soffit, w 9-3: View of upstream end cor 9-4: View of wearing surface of	valls and foundation nponents rracking	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions	October 30, 2024 Evan Montreuil, P.Eng. Tape Overcast	Photos: 9-1: Title Page 9-2: View of structure soffit, w 9-3: View of upstream end cor 9-4: View of wearing surface of 9-5: View of rotten/loose barri 9-6: View of loose guiderail ca	valls and foundation nponents cracking er post base ible	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature	October 30, 2024 Evan Montreuil, P.Eng. Tape Overcast 20°C	Photos: 9-1: Title Page 9-2: View of structure soffit, w 9-3: View of upstream end con 9-4: View of wearing surface of 9-5: View of rotten/loose barri 9-6: View of loose guiderail ca 9-7: View of erosion between 9-8: View of watercourse upst	valls and foundation nponents cracking er post base able rock protection ream	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature Last Inspection	October 30, 2024 Evan Montreuil, P.Eng. Tape Overcast 20°C December 6, 2022	<b>Photos:</b> 9-1: Title Page 9-2: View of structure soffit, w 9-3: View of upstream end con 9-4: View of wearing surface of 9-5: View of rotten/loose barri 9-6: View of rotten/loose barri 9-6: View of loose guiderail ca 9-7: View of erosion between 9-8: View of watercourse upst 9-9: View of watercourse dow	valls and foundation nponents cracking er post base able rock protection ream nstream	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature Last Inspection Additional Investigation Required	October 30, 2024         Evan Montreuil, P.Eng.         Tape         Overcast         20°C         December 6, 2022	Photos: 9-1: Title Page 9-2: View of structure soffit, w 9-3: View of upstream end cor 9-4: View of wearing surface of 9-5: View of rotten/loose barri 9-6: View of loose guiderail ca 9-7: View of loose guiderail ca 9-7: View of watercourse upst 9-8: View of watercourse dow None	valls and foundation nponents rracking er post base able rock protection ream nstream	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature Last Inspection Additional Investigation Required Total Rehabilitation	October 30, 2024         Evan Montreuil, P.Eng.         Tape         Overcast         20°C         December 6, 2022         Tighten cable guiderail. Replace all restriction of the second	Photos: 9-1: Title Page 9-2: View of structure soffit, w 9-3: View of upstream end con 9-4: View of wearing surface of 9-5: View of rotten/loose barri 9-6: View of loose guiderail ca 9-7: View of loose guiderail ca 9-7: View of erosion between 9-8: View of watercourse upst 9-9: View of watercourse dow None	valls and foundation nponents cracking er post base able rock protection ream nstream	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature Last Inspection Additional Investigation Required Total Rehabilitation Budget Costing	October 30, 2024         Evan Montreuil, P.Eng.         Tape         Overcast         20°C         December 6, 2022         Tighten cable guiderail. Replace all response         \$5,000	Photos:         9-1: Title Page         9-2: View of structure soffit, w         9-3: View of upstream end cor         9-4: View of wearing surface of         9-5: View of rotten/loose barri         9-6: View of loose guiderail ca         9-7: View of erosion between 1         9-8: View of watercourse upst         9-9: View of watercourse dow         None         otten posts.         Next Inspection	valls and foundation nponents rracking er post base able rock protection ream nstream	

Structure: 9

Element Group:	Culvert		Length:	15			
Element Name:	Barrels		Width:	4			
Location:			Height:		1.1		
Material:	Concrete	;	Count:		93		
Element Type:	Arch		Total Quantity:				
Environment:	Moderate I		Limited Insp'n:				
Protection System:		None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencie	Maint. Needs
	m <sup>2</sup>		93				
<b>Comments:</b> The concrete arch is in good condition with no visible defects.							
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

## Element Data

Element Group:	Culvert		Length:				
Element Name:	Inlet Compon	ents	Width:	4.3			
Location:			Height:	0.2			
Material:	Concrete		Count:	1			
Element Type:	Т		Total Quantity:	1.34			
Environment:	Benign		Limited Insp'n:	Yes			
Protection System:		Wearing Surface					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencie	Maint. Needs
	m <sup>2</sup>		1.34				
<b>Comments:</b> The inlet embankments and slope protection appear stable and are unobstructed.							
Recommended Work	K: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Culvert		Length:					
Element Name:	Outlet Compo	nents	Width:	4.3				
Location:			Height:		0.2			
Material:	Concrete		Count:		1			
Element Type:	-		Total Quantity:		1	.34		
Environment:	Moderate		Limited Insp'n:					
Protection System:		Wearing Surface						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencie	Maint. Needs	
	m <sup>2</sup>		1.34					
<b>Comments:</b> The outlet embankments and slope protection are stable. There is a HDPE pipe culvert which outlets just downstream of the main culvert.								
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Structure:	9

ſ

Element Group:	Barriers		Length:			3.85			
Element Name:	Railing Syst	tem	Width:						
Location:	Each Sid	e	Height:						
Material:	Steel		Count:		35				
Element Type:	3-Cable on Wo	od Post	Total Quantity:		1	34.75			
Environment:	Severe		Limited Insp'n:						
Protection System:	None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	m			134.75		Yes			
Comments:	Sagging cables observ	ved on both s	ides.						
<b>Recommended Work:</b> None 6-10 Years 1-5 Years <a>  </a> Visit Content of the second secon									

#### Element Data

Element Group:	Barriers		Length:					
Element Name:	Posts		Width:					
Location:			Height:					
Material:	Wood		Count:	37				
Element Type:			Total Quantity:			37		
Environment:	Severe		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each			35	2	Yes	Yes	
Each       35       2       Yes         Comments:       Two (2) posts near the northeast end are significantly rotten at the base and are loose.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								

Element Group:	Deck		Length:			4.3			
Element Name:	Wearing Sur	face	Width:		6.9				
Location:			Height:						
Material:	Surface Treat	ment	Count:		1				
Element Type:			Total Quantity:		2	29.67			
Environment:	Severe		Limited Insp'n:						
Protection System:									
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	m <sup>2</sup>		29.67						
Comments:	Some minor alligator c	racking obse	rved.						
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Element Group:	Foundat	lions	Length:				
Element Name:	Foundation (below	v ground level)	Width:				
Location:	Each E	ind	Height:				
Material:	Concrete		Count:				
Element Type:		Total Quantity:					
Environment:	Moderate		Limited Insp'n:			Yes	
Protection System:		None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%						
Comments:	Limited inspection due structure appears stab	to water level, how le.	vever visible portion	ons appear	to be in go	od condition ar	nd the
Recommended Wor	'k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Embankments	& Streams	Length:					
Element Name:	Streams and V	Vaterways	Width:					
Location:			Height:					
Material:	Bedrock		Count:					
Element Type:			Total Quantity:					
Environment:	Moderate		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100					
Comments:	The watercourse is unc	obstructed and in g	ood condition.					
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Embankments	& Streams	Length:						
Element Name:	Embankı	nents	Width:						
Location:	Each Co	orner	Height:						
Material:	Stone		Count:			4			
Element Type:			Total Quantity:			4			
Environment:	Moder	Limited Insp'n:							
Protection System:	Rip Rap								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	Each		3	1					
Comments:       The embankments are in good condition with large rip rap slope protection. Some minor erosion was observed between the rip-rap.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year									
			0.0011						

Element Group:	Signs	6	Length:					
Element Name:	Sign	S	Width:					
Location:	Each Corner		Height:					
Material:	Stee	I	Count:			4		
Element Type:		Total Quantity:			4			
Environment:	Sever	Limited Insp'n:						
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each		4					
Comments:	Four (4) end hazard sig	ons in place at the	guiderail terminat	tion are in g	ood conditi	on.		
Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								

Element Group:	Approa	ches	Length:		5			
Element Name:	Wearing S	urface	Width:	6.9				
Location:	Each E	nd	Height:					
Material:	Surface Treatment		Count:			2		
Element Type:			Total Quantity:			69		
Environment:	Seve	Limited Insp'n:						
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	m²		69					
Comments:	Minor aligator gracking	observed.						
Comments:       Minor aligator gracking observed.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								



Photo 9-2 - View of structure soffit, walls and foundation



Photo 9-3 - View of upstream elevation and embankment protection



Photo 9-4 - View of wearing surface cracking



Photo 9-5 - View of rotten/loose barrier post base



Photo 9-6 - View of loose guiderail cable



Photo 9-7 - View of erosion between rock protection



Photo 9-8 - View of watercourse upstream



Photo 9-9 - View of watercourse downstream

Site Number	10	Project Number	CA004	CA0043256.3165	
Structure Name	Lindsay Road 5 Culvert	Municipality	Northern Bruce Peninsula		
MTO Region Code	30	County	Bruce	Code	02
MTO District Code	33	Geographic Twp Code	377		





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

#### **Inventory Data**

Structure Name	Lindsay Road 5 Culvert	Site Number	10	
County	Bruce	Road Name	Lindsay Road 5	
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.	
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula	
Structure Type	Steel - SP - CSP - PA	AADT	350	
Span (m)	4.4 No. 1	% Trucks	15%	
Height (m)	2.8	Overall Structure Width (m)	18.3	
Direction of Structure	North/South	Roadway Width (m)	6.1	
Year Built/Rehabilitated	1970	Total Deck Length (m)	4.4	
Current Load Limit	None	Total Deck Area (s.m.)	81	
Detour Length (km)	5.5	Heritage Des.	None	
Waterway	Chin Creek			
Inspection Data				
Inspection Data Date of Inspection	October 30, 2024	Photos:		
Inspection Data Date of Inspection Name of Inspector	October 30, 2024 Evan Montreuil, P.Eng.	Photos: 10-1: Title Page 10-2: View of watercourse up:	stream / inlet component	
Inspection Data Date of Inspection Name of Inspector Equipment Used	October 30, 2024 Evan Montreuil, P.Eng. Tape, pick, hammer	Photos: 10-1: Title Page 10-2: View of watercourse up: 10-3: View of watercourse do 10-4: View of upstream elevat	stream / inlet component wnstream ion and slope protection	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions	October 30, 2024 Evan Montreuil, P.Eng. Tape, pick, hammer Sun & Cloud	Photos: 10-1: Title Page 10-2: View of watercourse up: 10-3: View of watercourse do 10-4: View of upstream elevat 10-5: View of culvert barrel 10-6: Localized failure with co	stream / inlet component wnstream ion and slope protection omplete section loss in base of	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature	October 30, 2024 Evan Montreuil, P.Eng. Tape, pick, hammer Sun & Cloud 20°C	Photos: 10-1: Title Page 10-2: View of watercourse up 10-3: View of watercourse do 10-4: View of upstream elevat 10-5: View of culvert barrel 10-6: Localized failure with co culvert. 10-7: Corrosion and section lo	stream / inlet component wnstream ion and slope protection omplete section loss in base of sss at base of culvert	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature Last Inspection	October 30, 2024 Evan Montreuil, P.Eng. Tape, pick, hammer Sun & Cloud 20°C December 6, 2022	Photos: 10-1: Title Page 10-2: View of watercourse up: 10-3: View of watercourse do 10-4: View of upstream elevat 10-5: View of culvert barrel 10-6: Localized failure with co culvert. 10-7: Corrosion and section lo	stream / inlet component wnstream ion and slope protection omplete section loss in base of ss at base of culvert	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature Last Inspection Additional Investigation Required	October 30, 2024 Evan Montreuil, P.Eng. Tape, pick, hammer Sun & Cloud 20°C December 6, 2022	Photos: 10-1: Title Page 10-2: View of watercourse up: 10-3: View of watercourse do 10-4: View of upstream elevat 10-5: View of culvert barrel 10-6: Localized failure with co culvert. 10-7: Corrosion and section lo	stream / inlet component wnstream ion and slope protection omplete section loss in base of sss at base of culvert	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature Last Inspection Additional Investigation Required Total Rehabilitation	October 30, 2024 Evan Montreuil, P.Eng. Tape, pick, hammer Sun & Cloud 20°C December 6, 2022 Install approach and barrier protection	Photos:         10-1: Title Page         10-2: View of watercourse up:         10-3: View of watercourse do         10-4: View of upstream elevat         10-5: View of culvert barrel         10-6: Localized failure with co-         culvert.         10-7: Corrosion and section loc         None         n. Install end hazard signs.	stream / inlet component wnstream ion and slope protection omplete section loss in base of ss at base of culvert	
Inspection Data Date of Inspection Name of Inspector Equipment Used Weather Conditions Temperature Last Inspection Additional Investigation Required Total Rehabilitation Budget Costing	October 30, 2024         Evan Montreuil, P.Eng.         Tape, pick, hammer         Sun & Cloud         20°C         December 6, 2022         Install approach and barrier protection         \$50,000	Photos:         10-1: Title Page         10-2: View of watercourse up:         10-3: View of watercourse do         10-4: View of upstream elevat         10-5: View of culvert barrel         10-6: Localized failure with co-         culvert.         10-7: Corrosion and section loc         None         n. Install end hazard signs.         Next Inspection	stream / inlet component wnstream ion and slope protection omplete section loss in base of ss at base of culvert	

Element Group:	Decks		Length:				
Element Name:	Wearing Sur	face	Width:				
Location:			Height:				
Material:	Surface Treatment (		Count:				
Element Type:	1		Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:		None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:	New surface treatmen	t is in good c	ondition.				
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

## Element Data

Element Group:	Culverts		Length:					
Element Name:	Inlet Compor	nent	Width:					
Location:	North End		Height:					
Material:	Stone and Earth C		Count:					
Element Type:	Т		Total Quantity:					
Environment:	Moderate L		Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100					
Comments:	Vegetated / rip-rap slo	pes appear s	table.					
Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								

Element Group:	Culverts		Length:					
Element Name:	Outlet Components		Width:					
Location:	South End		Height:					
Material:	Stone and Earth		Count:					
Element Type:			Total Quantity:					
Environment:	Moderate		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100					
Comments: Heavily vegetated slopes appear stable. The culvert end is bent.								
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent								

Element Group:	Culvert		Length:						
Element Name:	Barrel		Width:						
Location:			Height:						
Material:	Steel		Count:						
Element Type:	Multi Plate Pipe Arch		Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:	Galvanized								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform.	Maint.		
						Deficiencies	Needs		
	%		40	50	10	Yes	Yes		
Comments:	Moderate corrosion at water level with minor to moderate section loss observed.								
	Minor localized deformations observed.								
1m long section in base of culvert has failed due to complete section loss.									
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent				
	Monitor the section los	onsider rep	air vs repla	cement when s	ection loss				
	exceeds acceptable limits.								

#### Element Data

Element Group:	Streams/Embankments		Length:					
Element Name:	Streams and Waterways		Width:					
Location:			Height:					
Material:	Bedrock and Earth		Count:					
Element Type:			Total Quantity:					
Environment:	Moderate		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		50	50				
Comments: A blockage of sticks and debris was observed upstream of the inlet.								
Recommended Work:	: None Remove blockage.	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Streams/Embankments		Length:					
Element Name:	Embankment		Width:					
Location:	Each Corner		Height:					
Material:			Count:	4				
Element Type:			Total Quantity:	4				
Environment:	Moderate		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each Corner		6					
<b>Comments:</b> The embankments are well vegetated or covered with rip rap slope protection and appear stable.								
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent			
Element Group:	Approach	es	Length:					
---	--	------------	---	------	------	---	------------------------	
Element Name:	Wearing Su	rface	Width:					
Location:	Each En	d	Height:					
Material:	Surface Trea	tment	Count:					
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:			None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100					
Recommended Work: None 6-10 Years 1-5 Years < 1 Year								
Element Group:	Accessori	es	Length:					
Element Group: Element Name:	Accessori Signs	es	Length: Width:					
Element Group: Element Name: Location:	Accessori Signs Approach	es es	Length: Width: Height:					
Element Group: Element Name: Location: Material:	Accessori Signs Approach Steel	es es	Length: Width: Height: Count:			2		
Element Group: Element Name: Location: Material: Element Type:	Accessori Signs Approach Steel	es es	Length: Width: Height: Count: Total Quantity:			2 2		
Element Group: Element Name: Location: Material: Element Type: Environment:	Accessori Signs Approach Steel Severe	es es	Length: Width: Height: Count: Total Quantity: Limited Insp'n:			2 2		
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System:	Accessori Signs Approach Steel Severe	es es	Length: Width: Height: Count: Total Quantity: Limited Insp'n: None			2 2		
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data:	Accessori Signs Approach Steel Severe Units	es Exc.	Length: Width: Height: Count: Total Quantity: Limited Insp'n: None Good	Fair	Poor	2 2 Perform. Deficiencies	Maint. Needs	
Element Group: Element Name: Location: Material: Element Type: Environment: Protection System: Condition Data:	Accessori Signs Approach Steel Severe Units Each	es Exc.	Length: Width: Height: Count: Total Quantity: Limited Insp'n: None Good 2	Fair	Poor	2 2 Perform. Deficiencies Yes	Maint. Needs Yes	



Photo 10-2: View of watercourse upstream and inlet component



Photo 10-3: View of watercourse downstream



Photo 10-4: View of upstream elevation and slope protection



Photo 10-5: View of culvert barrel



Photo 10-6: Localized failure with complete section loss in base of culvert.



Photo 10-7: Corrosion and section loss at base of culvert

# **Bridge/Culvert Inspection Report**

Site Number	11	Project Number	CA0043256.3165		
Structure Name	Myles Bay Shore Road Bridge	Municipality	Northern Bruce Peninsula		
MTO Region Code	30	County	Bruce Code 02		
MTO District Code	33	Geographic Twp Code	377		





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

## Bridge/Culvert Inspection Report

#### **Inventory Data**

Structure Name	Myles Bay Shore Road Bridge	Site Number	11
County	Bruce	Road Name	Myles Bay Shore Road
Municipality	Northern Bruce Peninsula	Road Type	Rural Local
Bridge or Culvert	Bridge	Owner	Northern Bruce Peninsula
Structure Type	Concrete - Rigid Frame	AADT	300
Span (m)	7.3 No. 1	% Trucks	5%
Height (m)	2.2	Overall Structure Width (m)	6.6
Direction of Structure	East/West	Roadway Width (m)	6
Year Built/Rehabilitated	2001	Total Deck Length (m)	8.4
Current Load Limit	None	Total Deck Area (s.m.)	50
Detour Length (km)	3	Heritage Des.	None
Waterway	Old Woman's River		
Inspection Data			
Date of Inspection	October 31, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	11-1: Title Page 11-2: View of east structure e	levation
Equipment Used	Tape, pick, hammer	11-3: View of west structure e 11-4: View of structure soffit	elevation
Weather Conditions	Sun & Cloud	11-5: View of embankment er 11-6: View of debris build-up	osion along curb (typ.)
Temperature	20°C	11-7: View of wearing surface 11-8: View of erosion at curb	e and approach patching termination (typ.)
Last Inspection	December 7, 2022	11-9: View of abutment wall a 11-10: View of watercourse d 11-11: View of watercourse u	and footing ownstream, barrier and curb pstream
			1
Additional Investigation Required		Deck condition survey	
Total Rehabilitation	Upgrade the bridge barrier protection	and install approach barrier protec	tion to meet current Code.
Total Rehabilitation Budget Costing	\$100,000	Next Inspection	October 2026

Element Group:	Decks		Length:				
Element Name:	Wearing Sur	face	Width:				
Location:			Height:				
Material:	Surface Treat	Surface Treatment					
Element Type:		-					
Environment:	Severe	Severe					
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%			100			
Comments: Recommended Work	c: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Decks		Length:				
Element Name:	Deck To	р	Width:				
Location:			Height:				
Material:	Concrete	9	Count:				
Element Type:		-					
Environment:	Moderate	Э	Limited Insp'n:			$\checkmark$	
Protection System:							
Condition Data:	Unite	Evo	Good	Foir	Poor	Perform.	Maint.
	Units	EXC.	900u	Fall	FUUI	Deficiencies	Needs
	%		100				
Comments:	Limited inspection due	to cover by gr	anulars and surface	e treatment v	wearing su	rface.	
			_				
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		
	When the surface trea	tment reaches	the end of its lifecy	cle, remove	and inspec	ct the condition	of the top
	deck. Consider placing	a waterproofi	ng membrane and p	paving the s	tructure de	ck to maximize	the
	service life of this high	asset value st	ructure.				

Element Group:	Decks		Length:				
Element Name:	Thick Sla	b	Width:				
Location:			Height:				
Material:	Concrete		Count:				
Element Type:							
Environment:	Moderate	Moderate					
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:	The soffit is in good co	ndition with no	o visible defects.				
Recommended Work	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Structure: 11

Element Group:	Decks		Length:				
Element Name:	Drainage		Width:				
Location:			Height:				
Material:	Concrete	Concrete					
Element Type:	Curb		Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:							
	Units	Evo	Good	Fair	Door	Perform.	Maint.
Condition Data:		LXC.			FUUI	Deficiencies	Needs
	%			100		Yes	Yes
Comments:	Road sand build-up an curb terminations.	d vegetation	observed along c	urb lines. N	Aild to mode	erate erosion o	bserved at
Recommended Work	c: None	6-10 Years	1-5 Years	< 1 Year	Urgent		
Clear debris along curbs annually to maintain proper drainage, repair erosion and consider placing asphalt or conrete spillways at each curb termination to minimize future erosion.							

#### Element Data

Element Group:	Sidewalks/cu	irbs	Length:					
Element Name:	Curbs		Width:					
Location:			Height:					
Material:	Concrete		Count:					
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		93	5	2			
Comments: The concrete is in good condition with some observed minor damage to ends from maintenance equipment.								
		0-10 Teals		< i Tear	orgent			

Element Group:	Barriers		Length:					
Element Name:	Railing Syste	ms	Width:					
Location:			Height:					
Material:	Steel		Count:					
Element Type:	Box Beam		Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		95	5		Yes		
Comments: 7% 95 5 1 <td< td=""></td<>								

Element Group:	Barriers		Length:						
Element Name:	Posts		Width:						
Location:			Height:						
Material:	Steel	Steel							
Element Type:	I-Beam	I-Beam							
Environment:	Severe		Limited Insp'n:						
Protection System:									
	Linite	Evo	Cood	Foir	Door	Perform.	Maint.		
Condition Data:	Units	LXC.	Guu	i ali	FUUI	Deficiencies	Needs		
	%		100			Yes			
Comments:	The end posts are unp	rotected and	hazardous to road	users. The	current cor	figuration does	not meet		
	code.								
Recommended Wo	ork: None	6-10 Years	1-5 Years	< 1 Year	Urgent				
Replace the structure barrier protection to meet current code and install approach barrier protection with proper end termination.									

#### Element Data

Element Group:	Abutment	S	Length:				
Element Name:	Abutment W	alls	Width:				
Location:			Height:				
Material:	Concrete	Concrete				2	
Element Type:			Total Quantity:				
Environment:	Moderate		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:	Minor surface cracking	was observe	d.				
Recommended Wo	ork: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Abutment	S	Length:					
Element Name:	Wingwall	S	Width:					
Location:			Height:					
Material:	Armour Stone / Field Stone		Count:			4		
Element Type:			Total Quantity:					
Environment:	Moderate	9	Limited Insp'n:	:				
Protection System:								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		50		50	Yes	Yes	
Comments: Recommended Wo	% 50 50 Yes Yes   Comments: The two wingwalls on west side are armour stone and are in good condition. The two wingwalls on the east side are fieldstone and are showing moderate to severe erosion. The two wingwalls on the east side are fieldstone and are showing moderate to severe erosion.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent Repair or replace wingwalls on east side.							

Structure: 11

Element Group:	Foundat	ions	Length:				
Element Name:	Foundation (below	r ground level)	Width:				
Location:			Height:				
Material:	Concre	ete	Count:				
Element Type:			Total Quantity:				
Environment:	Moderate		Limited Insp'n:			Yes	
Protection System:							
Condition Data:	Linits	Evo	Good	Fair	Poor	Perform.	Maint.
	Offits	EXC.	Guu		FUUI	Deficiencies	Needs
	%		100			Yes	Yes
Comments:	Limited inspection due	to water level. Ex	posed portions of	the footings	are in goo	d condition.	
	Previous inspection co	mments: I he south	h footings appear	stable and a	are well pro	tected. The nor	theast
	footing appears stable	, but is poorly prote	ected. The northw	est footing is	s heavily ui	ndermined and	poorly
	protected.						
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent		
	None based on curren	t inspection.		-			
	Previous inspection re	commendation: Ur	nderpin and stabili	ize northwes	t footing ar	nd provide more	rip-rap
	and rock protection to	the northeast and	northwest footings	S.			

#### Element Data

Element Group:	Embankments	& Streams	Length:				
Element Name:	Streams and V	Vaterways	Width:				
Location:			Height:				
Material:	Earth / S	Earth / Stone					
Element Type:		ŗ					
Environment:	Modera	Moderate					
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:	The watercourse is sta	ble with large sto	ne (boulders) throu	ughout.		¢	
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Embankments	& Streams	Length:				
Element Name:	Embankn	nents	Width:				
Location:			Height:				
Material:	Earth / Stone		Count:			4	
Element Type:			Total Quantity:			4	
Environment:	Moderate		Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each			2	2	Yes	Yes
Comments: Recommended Wo	The slopes are made u quadrants. <b>rk:</b> None Repair crossion and pla	6-10 Years	getated earth. Mile	d to severe	erosion obs Urgent	served at all fou	
	Repair erosion and pla	ice additional slop	e protection where	e required.			

Element Group:	Signs		Length:				
Element Name:	Signs		Width:				
Location:			Height:				
Material:	Steel C		Count:				
Element Type:		То				4	
Environment:	Moderate	Э	Limited Insp'n:				
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	Each		4				
Comments:	Four end hazard signs	are in place a	nd are in good co	ndition.			
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Approach	es	Length:				
Element Name:	Wearing Sur	face	Width:				
Location:			Height:				
Material:	Surface Treatment 0		Count:				
Element Type:	Тс		Total Quantity:				
Environment:	Moderate	Moderate L					
Protection System:							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%			100		Yes	Yes
Comments:	The approach wearing surface is surface treatment in fair condition. Differential settlement observed at each approach with multiple layers of cold patch visible.						
Recommended Work: None 6-10 Years Monitor settlement and continue to pa and approaches.		1-5 Years atch as required.	< 1 Year Consider re	Urgent placing roa	ad base and pa	iving deck	



Photo 11-2: View of east structure elevation



Photo 11-3: View of west structure elevation



11-4: View of structure soffit



11-5: View of embankment erosion



11-6: View of sand and vegetation build-up along curb (typ.)



11-7: View of structure wearing surface and approach patching



11-8: View of erosion at curb termination (typ.)



11-9: View of abutment wall and footing



11-10: View of watercourse downstream, barrier and curb



11-11: View of watercourse upstream

# **Bridge/Culvert Inspection Report**

Site Number

12

**Project Number** 

CA0043256.3165

Structure Name

MTO Region Code

**MTO District Code** 

Stokes Bay Road Culvert	-
30	-
33	-

Municipality County Geographic Twp Code

Northern Bruce Peninsula								
Bruce Code 02								
	377							





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

## Bridge/Culvert Inspection Report

#### **Inventory Data**

Structure Name	Stokes Bay Road Culvert	Site Number	12
County	Bruce	Road Name	Stokes Bay Road
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula
Structure Type	Steel - SP - SCP - PA	AADT	350
Span (m)	4.7 No. 1	% Trucks	15%
Height (m)	3	Overall Structure Width (m)	22
Direction of Structure	East/West	Roadway Width (m)	6.1
Year Built/Rehabilitated	1970	Total Deck Length (m)	4.7
Current Load Limit	None	Total Deck Area (s.m.)	103
Detour Length (km)	4	Heritage Des.	None
Waterway	Old Woman's River (Fern Creek Drain)		
Inspection Data			
Date of Inspection	October 31, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	12-1: Title Page 12-2: View of culvert inlet	
Equipment Used	Tape, pick, hammer	12-3: View of culvert barrel 12-4: View of surface treatmer	nt wearing surface
Weather Conditions	Overcast	12-5: View of corrosion / swel 12-6: View of embankment sco	ling in the haunches (typ.) our at the inlet.
Temperature	20°C	12-7: View of culvert inlet end 12-8: View of downstream cul	vert end and watercourse
Last Inpsection	December 7, 2022	12-9: View of upstream culver	t end and watercourse
Additional Investigation Required	Complete annual inspections of the cu	lvert barrel to monitor the deforma	tion and corrosion.
Total Rehabilitation	Install approach and barrier protection	to Code. Repair erosion and place	e rip-rap erosion protection.
Total Rehabilitation Budget Costing	\$75,000	Next Inspection	October 2026

Structure: 12

Element Group:	Decks		Length:				
Element Name:	Wearing Surf	face	Width:				
Location:			Height:				
Material:	Surface Treatment C		Count:				
Element Type:	Т		Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:			None	9			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%			75	25		
Comments: The surface treatment wearing surface is relatively fair condition with minor settlement, wheel path rutting observed, and cracking along the shoulders.   Recommended Work: None							
Replace the surface treatment with r			oad resurfacing.				

#### Element Data

Element Group:	Barriers		Length:				
Element Name:	Barrier		Width:				
Location:	Each Side		Height:				
Material:			Count:				
Element Type:		T					
Environment:	Severe	Limited Insp'n:					
Protection System:			None	9			
	l Inits	Evo	Good	Foir	Poor	Perform.	Maint.
Condition Data:	OTINS	Exc.	Good Fair	FUUI	Deficiencies	Needs	
	%					Yes	
Comments:	There is currently no b	arrier protection	on in place. The	clear zone i	s approxim	ately 3 m.	
Recommended Work	:: None	6-10 Years	1-5 Years	< 1 Year	Urgent		
	n to meet curr	ent code require	ments. Red	uce the pos	sted speed limi	t to	
	45km/hr until barrier pr	otection is ins	stalled.				

Element Group:	Culverts		Length:					
Element Name:	Inlet Compor	nent	Width:					
Location:	East End		Height:					
Material:	Stone and E	arth	Count:					
Element Type:			Total Quantity:					
Environment:	Moderate	•	Limited Insp'n:					
Protection System:			None	9				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		75	25		Yes	Yes	
Comments: Heavily vegetated embankments with rock protection appear stable; however, some of the rock protection appears to have failed and fallen into the streambed. Moderate scour of the upstream embankments occurring.								
Recommended Work:   None   6-10 Years   1-5 Years   < 1 Year   Urgent     Repair scour by replacing and/or placing additional rock protection to prevent additional scour.						cour.		

Structure: 12

Element Group:	Culverts		Length:				
Element Name:	Outlet Compo	nents	Width:				
Location:	West End	b	Height:				
Material:	Stone and E	arth	Count:				
Element Type:			Total Quantity:				
Environment:	Moderate	9	Limited Insp'n:				
Protection System:			None	;			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		30	60	10	Yes	Yes
Comments: Heavily vegetated embankments with rock protection appear stable; however, some of the rock protection appears to have failed and fallen into the streambed. Moderate scour of the downstream embankments occurring.							
Recommended Work:   None   6-10 Years   1-5 Years   < 1 Year   Urgent     Repair scour and replace/add additional rock protection to prevent additional scour.							

#### Element Data

Element Group:	Culvert		Length:					
Element Name:	Barrel		Width:					
Location:			Height:					
Material:	Steel		Count:					
Element Type:	Pipe Arch		Total Quantity:					
Environment:	Moderate	Limited Insp'n:						
Protection System:	Galvanized							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		40	40	20	Yes		
Comments: Deformations visible at the obvert. Corrosion and swelling observed in the haunches near the high water level. Minor to moderate section loss observed.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year								
Monitor the deformations and section loss.								

Element Group:	Foundatio	n	Length:					
Element Name:	Foundation (belo	w grade)	Width:					
Location:			Height:					
Material:	Granular		Count:					
Element Type:			Total Quantity:					
Environment:	Moderate	Limited Insp'n:			Yes			
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
						Yes		
Comments: Limited inspection of the foundation due to cover. Moderate scour observed under base and around haunches at the pipe inlet.								
Recommended Work: None 6-10 Years <u>1-5 Years</u> < 1 Year Urgent Place rock protection or lean concrete to prevent additional scour.								

Structure: 12

Element Group:	Streams/Embar	nkments	Length:						
Element Name:	Streams and Wa	aterways	Width:						
Location:			Height:						
Material:	Stone/Sand C		Count:						
Element Type:	Т		Total Quantity:						
Environment:	Moderate	Limited Insp'n:							
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			100					
Comments:	Low velocity watercour	se with no visi	ble obstruction a	at the time o	f inspectior	າ.			
<b>Recommended Work:</b> None 6-10 Years 1-5 Years < 1 Year Urgent									

#### Element Data

Element Group:	Streams/Embar	nkments	Length:						
Element Name:	Embankme	ent	Width:						
Location:	Each Corr	ier	Height:						
Material:	Stone / Earth		Count:			4			
Element Type:						4			
Environment:	Moderate	Moderate							
Protection System:	None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	Each			4					
Comments:	Heavily vegetated with	some minor	erosion observed		<u>.</u>	<u>.                                    </u>			
Recommended Worl	k: None Repair erosion and pla	6-10 Years ice slope prot	tection.	< 1 Year	Urgent				

Element Group:	Signs		Length:						
Element Name:	Signs		Width:						
Location:	Each Corr	er	Height:						
Material:			Count:						
Element Type:			Total Quantity:			4			
Environment:	Severe	Limited Insp'n:							
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	Each		4			Yes			
Comments: Four (4) end hazard signs in place are in good condition.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year									
	Install speed limit signage or barrier protection.								

Element Group:	Approache	es	Length:						
Element Name:	Wearing Sur	face	Width:						
Location:	Each End		Height:						
Material:	Surface Treat	tment	Count:						
Element Type:			Total Quantity:						
Environment:	Severe		Limited Insp'n:						
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%		75	25			Yes		
Comments:	The surface treatment	is in good to fa	air condition with m	ninor wheel	path rutting	observed.			
Recommended Work: None 6-10 Years 1-5 Years < 1 Year									



Photo 12-2: View of culvert inlet



Photo 12-3: View of culvert barrel



Photo 12-4: View of surface treatment wearing surface



Photo 12-5: View of corrosion / swelling in the haunches (typ.)



Photo 12-6: View of embankment scour at the inlet.



Photo 12-7: View of culvert inlet end



Photo 12-8: View of downstream culvert end and watercourse



Photo 12-9: View of upstream culvert end and watercourse

# **Bridge/Culvert Inspection Report**

Site Number	13	<b>Project Number</b>	CA004	CA0043256.3165		
Structure Name	Bury Road Bridge	Municipality Northern Bruce Peninsul				
MTO Region Code	30	County	Bruce	Code	02	
MTO District Code	33	Geographic Twp Code		377		





1051 2nd Ave. East

Owen Sound, Ontario N4K 2H8

Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

# Bridge/Culvert Inspection Report

<b>Inventory Data</b>			CA0043256.3165
Structure Name	Bury Road Bridge	Site Number	13
County	Bruce	Road Name	Bury Road
Municipality	Northern Bruce Peninsula	Road Type	Rural Local
Bridge or Culvert	Bridge	Owner	Northern Bruce Peninsula
Structure Type	Concrete Slab	AADT	100
Span (m)	6.1 No. 1	% Trucks	15%
Height (m)	2	Overall Structure Width (m)	7.5
Direction of Structure	East/West	Roadway Width (m)	5.5
Year Built/Rehabilitated	1960	Total Deck Length (m)	6.4
Current Load Limit	15 t	Total Deck Area (s.m.)	48
Detour Length (km)	8	Heritage Des.	None
Waterway	Old Woman's River (Fern Creek Drain)		
Inspection Data			
Date of Inspection	October 31, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	13-2: View of wearing surface	
Equipment Used	Tape, pick, hammer	13-4: View of approach and st 13-5: View southwest structur	tructure wearing surface
Weather Conditions	Overcast	13-6: View of east elevation, s	soffit and abutment wall
Temperature	20°C	13-7. View of west elevation, 13-8: View of abutment wall, 13-9: View of exposed rebar i 13-10: View of watercourse de	exposed footing and soffit n the soffit ownstream
Last Inpsection	December 7, 2022	13-11: View of watercourse u	pstream
Additional Investigation Required	Inspect Annually - Deck Soffit and Fo	oundations, deck condition survey	
Total Rehabilitation	Place approach and structure barrier p footing and foundation erosion repairs	protection to meet current Code. Cos.	omplete the concrete soffit,
Total Rehabilitation Budget Costing	\$150,000	Next Inspection	October 2026
Justification	Undertake rehabilitation to extend the limit to 35 km/hr. as interim measure structure annually to monitor conditic	e service life (short term) versus rep until barrier protection is installed on until rehabilitation.	blacement. Reduce speed to Code. Inspect the

Structure: 13

Element Group:	Decks		Length:				
Element Name:	Deck To	0	Width:				
Location:			Height:				
Material:	Concrete	Concrete					
Element Type:			Total Quantity:				
Environment:	Moderate	Limited Insp'n:			Yes		
Protection System:		Wearing Surface					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%			80	20		
Comments:	The visible ends are ir visible for inspection.	fair condition	, the majority of th	ne deck top	is debris/gr	avel covered ar	nd not
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		
	Clear the debris and g top.	ravel along cu	rb, perform a dec	k condition	survey, and	l seal and wate	rproof deck

#### Element Data

Element Group:	Decks		Length:					
Element Name:	Soffit - Thick	Slab	Width:					
Location:			Height:					
Material:	Concrete		Count:					
Element Type:			Total Quantity:					
Environment:	Moderate		Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%			30	70	Yes	Yes	
Comments: Spalling and delaminated concrete with rebar exposed on both sides at abutment walls. An exterior soffit crack is developing (possibly a shear failure) at the northwest corner soffit exterior and trough curb.								
Recommended Work:   None   6-10 Years   1-5 Years   < 1 Year   Urgent     Remove the delaminated concrete, clean or replace rebar and complete concrete repair. Waterproof the deck top to prevent further deterioration. Monitor the crack annually.         6						aterproof		

Element Group:	Barrier		Length:					
Element Name:	Railing Syst	em	Width:					
Location:	Each Side	e	Height:					
Material:	Concrete		Count:					
Element Type:	ר		Total Quantity:					
Environment:	Severe	Limited Insp'n:						
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%					Yes		
Comments:	No structure or approa	ch barrier pro	tection current in p	olace.				
Recommended Work: None 6-10 Years 1-5 Years <a>      Install structure and approach barrier protection to provide required vehicle safety.</a>								

Element Group:	Abutme	ents	Length:						
Element Name:	Abutment Walls	/Wingwalls	Width:						
Location:	Each S	Each Side							
Material:	Concrete		Count:						
Element Type:			Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:									
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform.	Maint.		
Condition Data.	%			50	50	Yes	Yes		
Comments: Spalling and delamination observed throughout. Hairline cracks at cold joint where abutment/wingwall meets the soffit at the northwest corner. Cracking observed at earth of the south quadrants. Surface spalling and calcite deposits were observed on each wingwall. Southwest wingwall deteriorating.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year									

#### Element Data

Element Group:	Foundations		Length:						
Element Name:	Foundation (below ground level)		Width:						
Location:	Each End		Height:						
Material:	Concrete		Count:						
Element Type:			Total Quantity:						
Environment:	Moderate		Limited Insp'n:		Yes				
Protection System:	None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			80	20	Yes	Yes		
Comments: Limited inspection due to silt cover. Exposed portions of the footings are showing moderate spalling. Some erosion surrounding the footing was observed at the downstream end and along south side and southwest corner. North side covered in silt.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year									

#### Element Data

Element Group:	Embankments & Streams		Length:					
Element Name:	Streams and Waterways		Width:					
			Height:					
		Count:						
Element Type:			Total Quantity:					
Environment:	Moderate		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform.	Maint.	
			0000			Deficiencies	Needs	
	%			80	20	Yes	Yes	
<b>Comments:</b> Erosion and settlement were observed at the structure outlet. The flow has shifted against the south abutment/footing with a silt deposit along the north abutment.								
<b>Recommended Work:</b> None 6-10 Years <u>1-5 Years</u> < 1 Year Urgent Place rip rap to prevent further erosion and clear the sediment deposit.								

Element Group:	Embankments & Streams		Length:					
Element Name:	Embankments		Width:					
Location:	Each Corner		Height:					
Material:			Count:	4				
Element Type:			Total Quantity:	4				
Environment:	Moderate		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each		4					
Comments: Heavily vegetated embankments appear stable.								
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent								

#### Element Data

Element Group:	Approaches		Length:					
Element Name:	Wearing Surface		Width:					
Location:			Height:					
Material:	Gravel		Count:					
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:	None							
	Unite	Exc	Good	Fair	Poor	Perform.	Maint.	
Condition Data:	OTIKS	LAC.	9000	i ali	1 001	Deficiencies	Needs	
	%			80	20	Yes	Yes	
<b>Comments:</b> Clear the debris and vegetation build along the edge of each shoulder to achieve drainage. The surface has minor potholes and wheel path rutting.								
Recommended Work:   None   6-10 Years   1-5 Years   < 1 Year   Urgent     Grade and clear the vegetation from the shoulder annually.   Image: Should be and should be annually.   Image: Should be annual should be annually.   Image: Should be an								

Element Group:	Accessories		Length:						
Element Name:	Signs	Width:							
Location:		Height:							
Material:	Steel	Count:	9						
Element Type:			Total Quantity:			9			
Environment:	Severe		Limited Insp'n:						
Protection System:	None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	Each		9			Yes	Yes		
Comments:	mments: Two (2) load limit signs, two (2) speed limit signs, four (4) end hazard signs and one (1) narrow structure sign in place and in good condition. Narrow structure sign missing from the post at the south approach.								
Recommended Wor	k: None Replace missing narro	6-10 Years w structure sigr	1-5 Years n.	< 1 Year	Urgent				



Photo 13-2: View of wearing surface



Photo 13-3: View of curb



Photo 13-4: View of approach and structure wearing surface



Photo 13-5: View of southwest structure wingwall



Photo 13-6: View of east structure elevation, exterior soffit and abutment wall



Photo 13-7: View of west structure elevation, exterior soffit and curb



Photo 13-8: View of abutment wall, exposed footing and soffit



Photo 13-9: View of exposed rebar in the soffit



Photo 13-10: View of watercourse downstream



Photo 13-11: View of watercourse upstream
## **Bridge/Culvert Inspection Report**

Site Number

14

**Project Number** 

CA0043256.3165

Structure Name

MTO Region Code

MTO District Code

East Road Culvert
30
33

Municipality County

Geographic Twp Code

CA00+5250.5105									
Northern Bruce Peninsula									
Bruce Code 02									
	377								





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

### Bridge/Culvert Inspection Report

Inventory Data			CA0043256.3165
Structure Name	East Road Culvert	Site Number	14
County	Bruce	Road Name	East Road
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula
Structure Type		AADT	350
Span (m)	3.7 No. 1	% Trucks	15%
Height (m)	2.8	Overall Structure Width (m)	20
Direction of Structure	East/West	Roadway Width (m)	5.5
Year Built/Rehabilitated	1975	Total Deck Length (m)	3.7
Current Load Limit	None	Total Deck Area (s.m.)	74
Detour Length (km)	32	Heritage Des.	None
Waterway	Stokes River		
Inspection Data			
Date of Inspection	October 30, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	14-1 - The Page 14-2: View of wearing surface	and guiderail
Equipment Used	Tape, pick, hammer	14-3: View of damaged guidera 14-4: Upstream culvert end ele	vation
Weather Conditions	Sun and Cloud	14-5: Downstream culvert end 14-6: View of culvert barrel an	d obstruction
Temperature	20°C	14-7: View of slope protection 14-8: View of watercourse dow	vnstream
Last Inspection	December 6, 2022	14-9: View of watercourse ups	tream
Additional Investigation Required		None	
Total Rehabilitation	Tighten the barrier protection cables reflectors. Clear obstruction inside c	and repair the connection to the post ulvert. Continue to monitor the corro	s. Replace damaged post sion of the barrel.
Total Rehabilitation Budget Costing	\$5,000	Next Inspection	October 2026
Justification	Continued maintenance to extend ser	rvice life and maintain user safety.	

Element Group:	Decks		Length:						
Element Name:	Wearing Sur	face	Width:						
Location:			Height:						
Material:	Surface Treat	ment	Count:						
Element Type:			Total Quantity:						
Environment:	Severe		Limited Insp'n:						
Protection System:	None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%		100						
<b>Comments:</b> The surface treatment is in good condition with minor wheel path rutting observed.									
Recommended Wor	K: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

#### Element Data

Element Group:	Barriers		Length:			230			
Element Name:	Barrier		Width:						
Location:			Height:						
Material:	Steel Cable/Wood Posts 0		Count:						
Element Type:	3-Cable Guid	erail	Total Quantity:						
Environment:	Severe		Limited Insp'n:						
Protection System:			None						
	Units	Exc.	Good	Fair	Poor	Perform.	Maint.		
Condition Data:		2/101	0000			Deficiencies	Needs		
	%			95	5	Yes	Yes		
<b>Comments:</b> Guiderail in overall fair condition with some of the post showing moderate rot. Impact damage visible on multiple posts with reflectors and/or cable brackets loose or damaged.									
Recommended Work: None 6-1 Repair and/or replace any c		6-10 Years any damaged	1-5 Years posts, reflectors of	< 1 Year or brackets.	Urgent				

Element Group:	Culverts		Length:					
Element Name:	Inlet Compo	nent	Width:					
Location:	East End		Height:					
Material:	Stone		Count:					
Element Type:			Total Quantity:					
Environment:	Moderate	9	Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100					
Comments:	The embankments and	d haunches a	re stable and rock	protected.				
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent								

Element Group:	Culvert	S	Length:				
Element Name:	Outlet Comp	onents	Width:				
Location:	West Er	nd	Height:				
Material:			Count:				
Element Type:			Total Quantity:				
Environment:	Modera	te	Limited Insp'n:				
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:	The embankments and	d haunches are	stable and rock p	orotected.			
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Culvert		Length:				
Element Name:	Barrel		Width:				
Location:			Height:				
Material:	Steel		Count:				
Element Type:	Multiple P	late	Total Quantity:				
Environment:	Modera	te	Limited Insp'n:				
Protection System:			Galvanize	ed			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		50	50			
Comments:	Rust and some corros was observed not exce	on were observ eding 5%. Mon	ed below the high itor the section lo	n water line. ss as it adv	At the inle ances.	t end, minor se	ection loss
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent							

#### Element Data

Element Group:	Streams/Emba	Inkments	Length:				
Element Name:	Streams and W	aterways	Width:				
Location:			Height:				
Material:	Earth / R	ock	Count:				I
Element Type:		-	Total Quantity:				
Environment:	Modera	te	Limited Insp'n:			-	
Protection System:		-	None	-			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%				100	Yes	Yes
Comments:	Debris buildup observ	ed inside culver	t restricting flow.				
Recommended Wor	k: None Clear debris to re-esta	6-10 Years ablish flow.	1-5 Years	< 1 Year	Urgent		

Structure:	14

Element Group:	Streams/Embar	nkments	Length:							
Element Name:	Embankm	ent	Width:							
Location:	Each Corr	ner	Height:							
Material:	Stone		Count:	6						
Element Type:			Total Quantity:			6				
Environment:			Limited Insp'n:							
Protection System:		None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs			
	Each Corner		6							
Comments:	<b>Comments:</b> The embankments appear stable with no sign of erosion or movement of the rock protection.									
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent					

#### Element Data

Element Group:	Signs		Length:					
Element Name:	Signs		Width:					
Location:	Corner		Height:					
Material:	Steel		Count:		4			
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:			None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each		4					
Comments:	End of guiderail post m	arker signs.						
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Approach	es	Length:				
Element Name:	Wearing Su	rface	Width:				
	Each En	d	Height:				
	Surface Treatment		Count:				
Element Type:							
Environment:	Severe		Limited Insp'n:				
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:	The surface treatment	is in good con	dition with minor w	heel path ru	tting obser	ved.	
Recommended Wor	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent		



Photo 14-2: View of wearing surface and guiderail



Photo 14-3: View of damaged guiderail post



Photo 14-4: Upstream culvert end elevation



Photo 14-5: Downstream culvert end elevation



Photo 14-6: View of culvert barrel and obstruction



Photo 14-7: View of slope protection



Photo 14-8: View of watercourse downstream



Photo 14-9: View of watercourse upstream

# **Bridge/Culvert Inspection Report**

Site Number	15	Project Number	CA004	CA0043256.3165		
Structure Name	Concession 4 Culvert	Municipality	Northern Bru	Northern Bruce Peninsula		
MTO Region Code	30	County	Bruce	Code	02	
MTO District Code	33	Geographic Twp Code		377		





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

### Bridge/Culvert Inspection Report

Structure Name	Concession 4 Culvert	Site Number	15
County	Bruce	Road Name	Concession 4
Municipality	Northern Bruce Peninsula	Road Type	Rural Local
manopanty		roud Type	
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula
Structure Type	Steel CSP (double)	AADT	50
Span (m)	2.8, 0.9 No. 2	% Trucks	10%
Height (m)	2.8 m, 0.6 m	Overall Structure Width (m)	6 m
	·		
Direction of Structure	East/West 45° skew	Roadway Width (m)	4 + wide shoulder
Year Built/Rehabilitated	2014	Total Deck Length (m)	
Current Load Limit	None	Total Deck Area (s.m.)	
Detour Length (km)	N/A (Dead End)	Heritage Des.	None
Waterway	Branch - Judges Creek	U	
Water way	Brunon Judges creek		
Inspection Data			
Date of Inspection	October 29, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	15-1: Title Page 15-2: View of wearing surface	and hazard signs
Equipment Used	Tape, pick, hammer	15-3: View of damaged sign 15-4: View of east culvert end	
Weather Conditions	Sun & Cloud	15-5: View of upper culvert ba 15-6: View lower culvert inlet	arrel obstruction
Temperature	13°C	15-7: View of watercourse ups	stream
Last Inspection	December 5, 2022		
I I I I I I I I I I I I I I I I I I I			
Additional Investigation Required	None		
Total Rehabilitation	Install approach and structure barrie	r protection.	
Total Rehabilitation Budget Costing	\$75,000	Next Inspection	October 2026
The second secon	<b>T</b> , 11 1 1 1 1		
Justification	Install barrier and approach protection	on for increased road user safetly.	

#### **Inventory Data**

Structure: 15

Element Group:	Decks	Decks							
Element Name:	Wearing Su	face	Width:						
Location:			Height:						
Material:	Gravel		Count:						
Element Type:	-		Total Quantity:						
Environment:	Severe		Limited Insp'n:						
Protection System:		Wearing Surface							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			100		Yes	Yes		
Comments: The granular wearing surface is in overall fair condition.									
Recommended Work: None 6-10 Years 1-5 Years <a> </a>									

#### Element Data

L

Element Group:	Barrier		Length:						
Element Name:	Railing System		Width:						
Location:	Each Sid	le	Height:						
Material:	Concret	e	Count:						
Element Type:			Total Quantity:						
Environment:	Severe		Limited Insp'n:						
Protection System:			None	;					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%					Yes			
Comments:									
Recommended Work: None 6-10 Years 1-5 Years <a>  Install barrier protection to Code to provide required vehicle safety.</a>									

Element Group:	Culverts	;	Length:					
Element Name:	Inlet Component		Width:					
Location:	East End	t	Height:					
Material:	Stone and E	arth	Count:					
Element Type:	-		Total Quantity:					
Environment:	Moderate		Limited Insp'n:			Yes		
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100			Yes	Yes	
Comments: Recommended Wor	Lower culvert inlet was <b>k:</b> None Clear obstruction to re-	obstructed wi 6-10 Years establish flow	th heavy vegetatio 1-5 Years	n.	Urgent			

Structure:	15

Element Group:	Culverts	3	Length:						
Element Name:	Outlet Compo	onents	Width:						
Location:	West En	West End							
Material:	Stone and E	arth	Count:						
Element Type:			Total Quantity:						
Environment:	Moderate		Limited Insp'n:			Yes			
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%		100						
Comments: Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

#### Element Data

Element Group:	Culvert		Length:				
Element Name:	Barrel		Width:				
Location:			Height:				
Material:	Steel		Count:				
Element Type:	Pipe Arcl	n	Total Quantity:				
Environment:	Moderate		Limited Insp'n:			Yes	
Protection System:			Galvar	nized			
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:							
			. e rouro		ergon		

Element Group:	Embankments &	Streams	Length:						
Element Name:	Streams and Wa	Streams and Waterways							
Location:			Height:						
Material:	Earth/Stor	ne	Count:						
Element Type:			Total Quantity:						
Environment:	Moderate	Moderate							
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%		100						
Comments:									
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Structure: 15

Element Group:	Embankments 8	Streams	Length:					
Element Name:	Embankm	ents	Width:					
Location:	Each Corr	Each Corner		_				
Material:	Earth/Sto	Earth/Stone C		4				
Element Type:			Total Quantity:			4		
Environment:	Moderat	.е	Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each			4				
Comments: Recommended Worl	The slopes are partially end. Embankments ap k: None	/ vegetated with pear stable. 6-10 Years	some rock protect	tion. Rock p < 1 Year	rotection ha	as been placed	at the inlet	

#### Element Data

Element Group:	Signs		Length:						
Element Name:	Signs		Width:						
Location:			Height:						
Material:	Steel		Count:		7				
Element Type:	Т		Total Quantity:			7			
Environment:	Severe		Limited Insp'n:						
Protection System:			Paint						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	Each		6		1	Yes	Yes		
Comments: Four (4) end hazd signs, one (1) narrow road and one speed warning sign are in good condition. Speed warning sign at the north approach is damaged.									
Recommended Wor	k: None Replace damaged spe	6-10 Years ed warning si	1-5 Years gn.	< 1 Year	Urgent				

Element Group:	Approac	Approaches							
Element Name:	Wearing Su	Wearing Surface							
Location:	Each Ei	nd	Height:						
Material:	Grave		Count:						
Element Type:			Total Quantity:						
Environment:	Severe	Severe							
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%		100			Yes	Yes		
Comments: Recommended Worl	<b>k:</b> None Grade annually and cl	6-10 Years ear vegetatior	s 1-5 Years from shoulders.	< 1 Year	Urgent				



Photo 15-2: View of wearing surface and hazard signs



Photo 15-3: View of damaged sign



Photo 15-4: View of east culvert end



Photo 15-5: View of upper culvert barrel



Photo 15-6: View lower culvert inlet obstruction



Photo 15-7: View of watercourse upstream

# **Bridge/Culvert Inspection Report**

Site Number	16	Project Number CA0043256.3		3256.3165	
Structure Name	Barrow Bay Road Culvert	Municipality	Northern Bruce Peninsula		
MTO Region Code	30	County	Bruce	<b>Code</b> 02	
MTO District Code	33	Geographic Twp Code	377		





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

#### **Inventory Data**

Structure Name	Barrow Bay Road Culvert	Site Number	16	
County	Bruce	Road Name	Barrow Bay Road	
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.	
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula	
Structure Type	Steel - SP - CSP - PA multi-plate	AADT	350	
Span (m)	7 No. 1	% Trucks	15%	
Height (m)	3.8	Overall Structure Width (m)	21.8	
Direction of Structure	North/South	Roadway Width (m)	6.1	
Year Built/Rehabilitated	1980	Total Deck Length (m)	7	
Current Load Limit	None	Total Deck Area (s.m.)	N/A	
Detour Length (km)	6	Heritage Des.	None	
Waterway	Judges Creek			
Inspection Data				
Date of Inspection	October 29, 2024	Photos:		
Name of Inspector	Evan Montreuil, P.Eng.	16-2: View of culvert barrel ir 16-3: View of culvert barrel ir	n elevation (outlet end) n elevation (inlet end)	
Equipment Used	Tape, pick, hammer	16-4: View of watercourse up 16-5: View of watercourse do	stream wnstream	
Weather Conditions	Sun & Cloud	16-6: View of culvert barrel ir 16-7: View of wearing surface	nterior	
Temperature	13°C	16-8: View of hazard sign and 16-9: View of rotten guiderail	guiderail (typ.) post base	
Last Inspection	December 5, 2022			
Additional Investigation Required		None		
Total Rehabilitation	Place erosion / embankment protecti	on, replace rotten barrier posts and t	ighten cable.	
Total Rehabilitation Budget Costing	\$5,000	Next Inspection	October 2026	
Justification	Due to the good condition of this struservice life.	ucture, improvements are recommen	ded to maximise the safe	

Element Group:	Decks		Length:				
Element Name:	Wearing Sur	face	Width:				
Location:	H		Height:				
Material:	Surface Treat	tment	Count:				
Element Type:	Т. Тт.		Total Quantity:				
Environment:	Severe	Limited Insp'n:					
Protection System:	None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%	100	85				
Comments:	Recently placed surface	ce treatment is	in excellent cond	ition.			
Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent							

#### Element Data

Element Group:	Barriers		Length:					
Element Name:	Barrier		Width:					
Location:	Each Side		Height:					
Material:	Steel/Woo	bd	Count:		20 posts - 3 cable			
Element Type:	3-Cable Guiderail T		Total Quantity:					
Environment:	Severe	Limited Insp'n:						
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%			90	10	Yes	Yes	
<b>Comments:</b> The three cable guide barrier is in fair overall condition. Some of the wooden posts are experiencing moderate to severe rot near their bases.								
Recommended Worl	<b>::</b> None Replace the rotten bar	6-10 Years rier posts.	1-5 Years	< 1 Year	Urgent			

Element Group:	Culverts		Length:					
Element Name:	Inlet Component V		Width:					
Location:	South En	d	Height:					
Material:	Stone/Ear	th	Count:					
Element Type:	Тс		Total Quantity:					
Environment:	Moderate L		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		50	40	10	Yes	Yes	
Comments:       Erosion observed between the stones in the headwall that appear to be shifting. Scour observed at southeast culvert haunch where the ditch drain meets the creek.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								

Structure:	16

I

Element Group:	Culverts		Length:						
Element Name:	Outlet Components		Width:						
Location:	North En	d	Height:						
Material:	Stone/Rip-Rap	/Earth	Count:						
Element Type:			Total Quantity:						
Environment:	Moderate I		Limited Insp'n:						
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			100					
Comments:	The outlet slopes are s	teep, but well v	egetated and stal	ole.					
<b>Recommended Work:</b> None 6-10 Years 1-5 Years < 1 Year Urgent									

#### Element Data

Element Group:	Culvert		Length:						
Element Name:	Barrel		Width:						
Location:			Height:						
Material:	Steel		Count:						
Element Type:	Pipe Arch		Total Quantity:						
Environment:	Moderate	Limited Insp'n:							
Protection System:		Galvanized							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			100					
Comments: Minor to moderate corrosion and swelling were observed at water level. No section loss observed.									
Recommended Worl	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Element Group:	Foundatio	Foundation					
Element Name:	Foundation (belo	w grade)	Width:				
Location:		[ ] [ ]					
Material:	Stone/Gra	vel	Count:				
Element Type:	Г		Total Quantity:				
Environment:	Moderate		Limited Insp'n:			Yes	
Protection System:	None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
Comments:	The foundation is not v	isible for inspe	ction due to high w	vater level, h	however the	e structure appe	ars stable.
Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year							

Element Group:	Streams/Emb	Streams/Embankments							
Element Name:	Streams and \	Vaterways	Width:						
Location:									
Material:	Eart	า	Count:						
Element Type:									
Environment:	Moder	Moderate							
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			100					
Comments:			-						
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent				

#### Element Data

Element Group:	Streams/Embankments		Length:					
Element Name:	Embankm	ent	Width:					
Location:	Each Corr	ner	Height:					
Material:	Stone/Ea	rth	Count:		-	4		
Element Type:	Tr		Total Quantity:			4	-	
Environment:	Moderate L		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each			4		Yes	Yes	
Each       4       Yes       Yes         Comments:       The embankments are heavily vegetated with minor signs of erosion.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year								

Element Group:	Approach	nes	Length:					
Element Name:	Wearing Su	Irface	Width:					
Location:	Each End		Height:					
Material:	Surface Treatment		Count:					
Element Type:	Т		Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%	100						
Comments:	Recently placed surface	ce treatment in e	excellent condition	1.				
Recommended Work	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Signs		Length:					
Element Name:	Signs		Width:					
Location:			Height:					
Material:	Steel	Count:		4				
Element Type:		Total Quantity:			4			
Environment:	Severe		Limited Insp'n:	d Insp'n:				
Protection System:		Paint						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each	4						
Comments:	Four (4) new end haza	rd signs in exce	ellent condition					
Recommended Work	c: None	6-10 Years	1-5 Years	< 1 Year	Urgent			



Photo 16-2: View of culvert barrel in elevation (outlet end)



Photo 16-3: View of culvert barrel in elevation (inlet end)



Photo 16-4: View of watercourse upstream



Photo 16-5: View of watercourse downstream



Photo 16-6: View of culvert barrel interior



Photo 16-7: View of wearing surface



Photo 16-8: View of hazard sign and guiderail (typ.)



Photo 16-9: View of rotten guiderail post base

# **Bridge/Culvert Inspection Report**

Site Number	17	Project Number	CA0043256.3165
Structure Name	Concession 4 Culvert N. of Barrow Bay Road	Municipality	Northern Bruce Peninsula
MTO Region Code	30	County	Bruce Code 02
MTO District Code	33	Geographic Twp Code	377





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

### Bridge/Culvert Inspection Report

#### **Inventory Data**

Structure Name	Concession 4 Culvert	Site Number	17
County	Bruce	Road Name	Concession 4
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula
Structure Type	Steel - SP - CSP - PA	AADT	250
Span (m)	3.6 No. 1	% Trucks	15%
Height (m)	2.41	Overall Structure Width (m)	18.4
Direction of Structure	East/West	Roadway Width (m)	5.8
Year Built/Rehabilitated	1985	Total Deck Length (m)	3.8
Current Load Limit	None	Total Deck Area (s.m.)	N/A
Detour Length (km)	6	Heritage Des.	None
Waterway	Branch Judges Creek		
Inspection Data			
Date of Inspection	October 29, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	17-1 - The Page 17-2: View of north approach	and speed warning sign
Equipment Used	Tape, pick, hammer	17-3: View of damaged hazard 17-4: View of culvert outlet an	nd drainage pipe
Weather Conditions	Overcast	17-5: View of culvert inlet end 17-6: View of watercourse ups	stream
Temperature	13°C	17-7: View of watercourse do	wnstream
Last Inspection	December 5, 2022		
Additional Investigation		None	
Kequirea			
Total Rehabilitation	Install barrier and approach protection	ion to Code.	
Total Rehabilitation Budget Costing	\$75,000	Next Inspection	October 2026
Justification	Due to good condition, rehabilitation and approach protection. Maintain	n is recommended to extend the safe posted speed at 35 km/hr. until instal	service life. Install barrier led.

Element Group:	Decks		Length:				
Element Name:	Wearing Sur	face	Width:				
Location:			Height:				
Material:	Gravel	Gravel					
Element Type:							
Environment:	Severe	Severe					
Protection System:		None					
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%		100				
Comments:	-		-				
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

#### Element Data

Element Group:	Barriers		Length:					
Element Name:	Barrier		Width:					
Location:	Each Side		Height:					
Material:			Count:					
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%					Yes		
Comments:	No barrier protection							
Recommended Wo	ork: None Install barrier to provid	6-10 Years e vehicle safe	1-5 Years ty	< 1 Year	Urgent			

Element Group:	Culverts		Length:							
Element Name:	Inlet Compo	nent	Width:							
Location:	End		Height:							
Material:	Stone and Earth		Count:							
Element Type:			Total Quantity:							
Environment:	Moderate		Limited Insp'n:							
Protection System:		None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs			
	%			100			Yes			
Comments:	Comments: Minor erosion observed near the culvert haunches.									
Recommended Wo	ork: None Repair erosion and pla	6-10 Years ace slope pret	1-5 Years ection as required.	< 1 Year	Urgent					

Structure: 17

#### Element Data

Element Group:	Culver	ts	Length:					
Element Name:	Outlet Comp	onents	Width:					
Location:	West E	nd	Height:					
Material:	Stone and Earth		Count:					
Element Type:								
Environment:	Moderate		Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%			80	20		Yes	
Comments:	Minor erosion observed CSP.	d near the culver	t haunches with m	aterial build	up at the b	ase of the uppe	er drainage	
Recommended Wo	ork: None Repair erosion and pla	6-10 Years ce slope pretection	1-5 Years on as required.	< 1 Year	Urgent			

#### Element Data

Element Group:	Culve	rt	Length:				
Element Name:	Barre	) I	Width:				
Location:			Height:				
Material:	Steel		Count:				
Element Type:	Pipe Ar	ch	Total Quantity:				
Environment:	Modera	Limited Insp'n:					
Protection System:			Galvanize	ed			
Condition Data:	Units	Exc	Good	Fair	Poor	Perform.	Maint.
	01113	EX0.	0000	i ali	1 001	Deficiencies	Needs
	%		70	30			
Comments:	Minor corrosion observ	ed near in the bas	se up to the haun	iches.			
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Foundat	tion	Length:						
Element Name:	Foundation (be	low grade)	Width:						
Location:			Height:						
Material:	Stone/Gravel		Count:						
Element Type:			Total Quantity:						
Environment:	Modera	ate	Limited Insp'n:			Yes			
Protection System:			None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
Comments:	The foundation is not v	visible for inspecti	on, however the c	culvert appea	ars stable.				
Recommended Wo	ork: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Element Group:	Streams/Emba	ankments	Length:					
Element Name:	Streams and W	/aterways	Width:					
Location:			Height:					
Material:			Count:					
Element Type:			Total Quantity:					
Environment:	Modera	ite	Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100					
Comments:								
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

#### Element Data

Element Group:	Streams/Emba	nkments	Length:					
Element Name:	Embankm	ient	Width:					
Location:	Each Cor	ner	Height:					
Material:			Count:					
Element Type:			Total Quantity:					
Environment:			Limited Insp'n:					
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%		100					
Comments:	Heavily vegetated stab	le slopes with m	inor signs of erosion.	-		-		
Recommended Wo	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Signs		Length:								
Element Name:	Signs		Width:								
Location:	Each Corner/Approaches		Height:								
Material:			Count:			6					
Element Type:			Total Quantity:			6					
Environment:	Severe		Limited Insp'n:								
Protection System:	None										
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs				
	Each	5			1	Yes	Yes				
Comments:       Two (2) speed warning sings and three (3) end hazard signs are in excellent condition. Southwest sign has impact damage and the post is leaning.         Recommended Work:       None       6-10 Years       1-5 Years       < 1 Year											
Straighten post and replace damagaed sign.											

Element Group:	Approaches		Length:								
Element Name:	Wearing Surf	ace	Width:								
Location:	Each End		Height:								
Material:	Gravel		Count:								
Element Type:			Total Quantity:								
Environment:	Severe		Limited Insp'n:								
Protection System:	None										
	l Inits	Exc	Good	Fair	Poor	Perform.	Maint.				
Condition Data:	OTIRS	EXC.	Good	i ali	F 001	Deficiencies	Needs				
	%		100				Yes				
<b>Comments:</b> At the time of inspection, the wearing surface was in overall good condition. Continue annual grading.											
Recommended Work:	None Continue annual maint	6-10 Years enance (annu	1-5 Years ual grading).	< 1 Year	Urgent						



Photo 17-2: View of north approach and speed warning sign



Photo 17-3: View of damaged hazard sign



Photo 17-4: View of culvert outlet and drainage pipe



Photo 17-5: View of culvert inlet end



Photo 17-6: View of watercourse upstream



Photo 17-7: View of watercourse downstream


Photo 17-7: View of culvert barrel interior



Photo 17-7: View of corrosion at haunches (typ.)

Site Number	18	Project Number CA0043256.310		65		
Structure Name	10th Sideroad Culvert	Municipality	Northern Bruce Peninsula			
MTO Region Code	30	County	Bruce	Code	02	
MTO District Code	33	Geographic Twp Code		377		





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

### **Inventory Data**

Structure Name	10th Sideroad Culvert	Site Number	18				
County	Bruce	Road Name	10th Sideroad				
Municipality	Northern Bruce Peninsula	Road Type	Rural Local				
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula				
Structure Type	Twin Steel - CSP	AADT	150				
Span (m)	1.5 No. 2	% Trucks	15%				
Height (m)	1.5	Overall Structure Width (m)	11.1				
Direction of Structure	North/South	Roadway Width (m)	4.6				
Year Built/Rehabilitated	1990	Total Deck Length (m)	3.6				
Current Load Limit	None	Total Deck Area (s.m.)	40				
Detour Length (km)	6	Heritage Des.	None				
Waterway	Branch Judges Creek						
Inspection Data							
Date of Inspection	October 29, 2024	Photos:					
Name of Inspector	Evan Montreuil, P.Eng.	18-1 - Title Page 18-2: View of structure wearin	ucture wearing surface				
Equipment Used	Tape, pick, hammer	18-3: View of culvert inlet con 18-4: View of culvert outlet co	<ul><li>18-3: View of culvert inlet components</li><li>18-4: View of culvert outlet components</li></ul>				
Weather Conditions	Overcast	18-5: View of erosion and voi 18-6: View of east culvert bar	d between culverts at outlet rel				
Temperature	5°C	18-7: View of west culvert bar 18-8: View of watercourse up	rrel stream				
т. т. т	December 5, 2022	18-9: View of watercourse do	wnstream				
Last Inspection	December 5, 2022						
Additional Investigation Required		None					
Total Rehabilitation	Install approach and barrier protective between/under culverts and armour	ion. Place inlet/outlet erosion protect stone.	ion and fill voids				
Total Rehabilitation Budget Costing	\$75,000	Next Inspection	October 2026				
Justification	Repair and install approach/barrier the safe service life of the structure. protection is installed.	protection recommended due to curre . Maintain posted speed of 35 km/hr.	ent good condition to extend until approach/barrier				

Structure:	18

Element Group:	Decks		Length:				
Element Name:	Wearing Sur	face	Width:				
Location:			Height:				
Material:	Gravel		Count:				
Element Type:			Total Quantity:				
Environment:	Severe		Limited Insp'n:				
Protection System:	None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%			100			Yes
Comments:	Minor wheel path ruttin	g and beginnii	ng stages of pot ho	les were ob	served.		
Recommended Work: None 6-10 Years 1-5 Years <a>      Grade the wearing surface annually.</a>							

### Element Data

L

Element Group:	Culverts		Length:						
Element Name:	Inlet Component		Width:						
Location:	South En	d	Height:						
Material:	Stone and Rip	-Rap	Count:						
Element Type:			Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:	None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			80	20	Yes	Yes		
<b>Comments:</b> Minor erosion observed around the pipes at the inlet. Heavy vegetation buildup at the inlet. Moderate corrosion of the barrel at the water line with no section loss.									
Recommended Wor	<b>k:</b> None Repair erosion and pla	6-10 Years ce rip rap slop	1-5 Years be protection. Clear	< 1 Year vegetation	Urgent to restore f	low.			

Element Group:	Culverts		Length:						
Element Name:	Outlet Components		Width:						
Location:	North End	d	Height:						
Material:	Stone and Rip	o-Rap	Count:						
Element Type:	-		Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:	None								
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			50	50	Yes	Yes		
Comments: Large rocks (blocks) and rip-rap protect the embankment. There is a void between the pipes, a scour developing at the culvert end, and a void beneath the culvert ends. Medium corrosion with no section loss was observed at the waterline.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year									

Structure: 18

Element Group:	Culvert		Length:						
Element Name:	Barrel		Width:						
Location:			Height:						
Material:	Steel		Count:						
Element Type:	CSP (circular)		Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:		Galvanized							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			100					
Comments: Minor corrosion was observed at the base of culverts up to high water level. No section loss observed. Separation of the joint near midspan observed in the east culvert.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year									

### Element Data

Element Group:	Foundation		Length:						
Element Name:	Foundation (belo	w grade)	Width:						
Location:									
Material:	Stone	Stone							
Element Type:	-		Total Quantity:						
Environment:	Moderate		Limited Insp'n:			Yes			
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
						Yes	Yes		
Comments: The culvert appears stable however the outlet end pipes are undermined with a void.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year									

Element Group:	Streams/Emban	kments	Length:				
Element Name:	Streams and Waterways		Width:				
Location:			Height:				
Material:	Earth		Count:				
Element Type:	-		Total Quantity:				
Environment:	Moderate		Limited Insp'n:				
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%			100			
Comments:							
Recommended Work	<b>::</b> None	6-10 Years	1-5 Years	< 1 Year	Urgent		

Element Group:	Streams/Embankments		Lenath:					
Element Name:	Embankment		Width:					
Location:	Each Cor	ner	Height:					
Material:	Earth / Rip-	Rap	Count:			6		
Element Type:		Total Quantity:			6			
Environment:								
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each			4	2	Yes		
Comments: The embankments are heavily vegetated with signs of erosion upstream and downstream from culverts. There is erosion under the armour stone at the southeast quadrant, and between the north (outlet) culvert ends.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year Urgent   Stabilize slopes with rock protection/rip-rap and fill voids between culverts and armour stone with lean								

### Element Data

Element Group:	Approaches		Length:					
Element Name:	Wearing Surface		Width:					
Location:	Each Er	d	Height:					
Material:	Gravel		Count:					
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:	None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%			100			Yes	
Comments: Minor wheel path rutting and pot holes starting to develop at the time of inspection.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year								

Signs		Length:					
Signs		Width:					
Each Corner/App	oroaches	Height:					
		Count:			6		
		Total Quantity:			6		
Severe	Limited Insp'n:						
None							
Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
Each	6						
Comments: Four (4) end hazard signs and two (2) speed warning signs in place and in excellent condition.   Recommended Work: None 6-10 Years 1-5 Years < 1 Year							
	Signs Signs Each Corner/App Severe Units Each Four (4) end hazard siç	Signs   Signs   Each Corner/Approaches   Severe   Units Exc.   Each 6   Four (4) end hazard signs and two (2)   : None 6-10 Years	Signs Length:   Signs Width:   Each Corner/Approaches Height:   Count: Total Quantity:   Total Quantity: Limited Insp'n:   Severe Limited Insp'n:   Units Exc. Good   Each 6   Four (4) end hazard signs and two (2) speed warning si   : None 6-10 Years	Signs Length:   Signs Width:   Each Corner/Approaches Height:   Count: Count:   Total Quantity: Imited Insp'n:   Severe Limited Insp'n:   Units Exc. Good   Fair 6   Four (4) end hazard signs and two (2) speed warning signs in place   : None	Signs Length:   Signs Width:   Each Corner/Approaches Height:   Count: Count:   Total Quantity: Imited Insp'n:   Severe Limited Insp'n:   Units Exc. Good   Fair Poor   Each 6   Four (4) end hazard signs and two (2) speed warning signs in place and in exc   None 6-10 Years 1-5 Years < 1 Year	Signs Length:   Signs Width:   Each Corner/Approaches Height:   Count: 6   Total Quantity: 6   Severe Limited Insp'n:   None None   Units Exc. Good Fair Poor Perform. Deficiencies   Each 6 Image: Severe	



Photo 18-2: View of structure wearing surface



Photo 18-3: View of culvert inlet components



Photo 18-4: View of culvert outlet components



Photo 18-5: View of erosion and voids between culverts at outlet



Photo 18-6: View of east culvert barrel



Photo 18-7: View of west culvert barrel



Photo 18-8: View of watercourse upstream



Photo 18-9: View of watercourse downstream

Site Number	19	Project Number	CA00	43256.	3165
Structure Name	Pike Bay Road Culvert	Municipality	Northern Brue	ce Penii	nsula
MTO Region Code	30	County	Bruce	Code	02
MTO District Code	33	Geographic Twp Code		377	





1051 2nd Ave. East Owen Sound, Ontario N4K 2H8 Tel: 519-376-7612 Fax: 519-376-8008 www.wsp.com

### **Inventory Data**

Structure Name	Pike Bay Road Culvert	Site Number	19
County	Bruce	Road Name	Pike Bay Road
Municipality	Northern Bruce Peninsula	Road Type	Rural Coll.
Bridge or Culvert	Culvert	Owner	Northern Bruce Peninsula
Structure Type	Steel SP-CSP-PA	AADT	350
Span (m)	4.5 No. 1	% Trucks	15%
Height (m)	3	Overall Structure Width (m)	18.9
Direction of Structure	North/South	Roadway Width (m)	6.7
Year Built/Rehabilitated	1990	Total Deck Length (m)	4.5
Current Load Limit	None	Total Deck Area (s.m.)	N/A
Detour Length (km)	6	Heritage Des.	None
Waterway	Judges Creek		
Inspection Data			
Date of Inspection	October 29, 2024	Photos:	
Name of Inspector	Evan Montreuil, P.Eng.	19-1: Title Page 19-2: View of culvert in eleva	tion and inlet components
Equipment Used	Tape, pick, hammer	19-3: View of culvert in eleva 19-4: View of culvert barrel ir	tion and outlet components nterior
Weather Conditions	Overcast	19-5: View of embankment 19-6: View of wearing surface	2
Temperature	5°C	19-7: View of barrier protection 19-8: View of watercourse up	on stream
Last Inspection	December 5, 2022	19-9: View of structure downs	stream
Additional Investigation Required		None	
Total Rehabilitation	Repair the 3-cable guiderail and pla	ce rip-rap erosion protection. Realign	n and/or replace signage.
Total Rehabilitation Budget Costing	\$20,000	Next Inspection	October 2026
Justification	Maintain safe barrier protection and maximize the lifespan of the culvert	realign signage for road user safety.	Complete erosion repairs to

Structure: 19

Element Group:	Decks		Length:					
Element Name:	Wearing Surfa	ace	Width:					
Location:			Height:					
Material:	Asphalt		Count:					
Element Type:			Total Quantity:					
Environment:	Severe		Limited Insp'n:					
Protection System:		None						
	Units	Exc.	Good	Foir	Poor	Perform.	Maint.	
Condition Data:				Fair	POOI	Deficiencies	Needs	
	%			50	50	Yes	Yes	
Comments:	Mild to moderate alligator of	cracking observ	ed throughout.					
Recommended Wor	<b>k:</b> None Repair base granular prior	6-10 Years to next resurfa	1-5 Years cing and consider	] < 1 Year installing a	Urgent frost taper a	at that time.		

### Element Data

Element Group:	Barriers		Length:						
Element Name:	Barrier		Width:						
Location:	Each Side	;	Height:						
Material:			Count:						
Element Type:			Total Quantity:						
Environment:	Severe		Limited Insp'n:						
Protection System:		None							
	Lipite	Exe	Good	Foir	Poor	Perform.	Maint.		
Condition Data:	Units	LAC.	Good	i ali	F 001	Deficiencies	Needs		
	%		75	25		Yes	Yes		
Comments:	Loose / sagging cable obs	served. Some p	osts showing mod	lerate rot.					
Recommended Wor	rk: None	6-10 Years	1-5 Years	< 1 Year	Urgent				
	Tighten cables and replace	e any rotten po	sts.		-				

Element Group:	Culverts		Length:						
Element Name:	Inlet Compone	ent	Width:						
Location:	South End		Height:						
Material:	Stone / Earth / S	Steel	Count:						
Element Type:			Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:		None							
	Units	Exc	Good	Fair	Poor	Perform.	Maint.		
Condition Data:		LXC.	9000	i ali	FUUI	Deficiencies	Needs		
	%			100					
Comments:	Bevelled end showing mine	or corrosion ne	ar water level. Hea	avily vegetat	ed banks a	appear stable.			
Recommended Wor	k: None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Element Group:	Culverts	;	Length:				
Element Name:	Outlet Compo	onents	Width:				
Location:	North En	d	Height:				
Material:	Stone / Earth /	' Steel	Count:				
Element Type:			Total Quantity:				
Environment:	Moderat	Moderate					
Protection System:			None				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs
	%			100			
Comments:	Bevelled end showing	minor corrosior	n near water level.	. Heavily ve	getated bai	nks appear sta	ble.
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent		

### Element Data

Element Group:	Culvert		Length:						
Element Name:	Barrel		Width:						
Location:			Height:						
Material:	Steel		Count:						
Element Type:	Pipe Arc	h	Total Quantity:						
Environment:	Moderat	Moderate Limited Insp'n:							
Protection System:		Galvanized							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			100					
Comments:	Minor corrosion observ	ed near water	level with no sect	ion loss app	arent.				
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent				

Element Group:	Foundatio	on	Length:					
Element Name:	Foundation (belo	w grade)	Width:					
Location:			Height:					
Material:	Gravel / Ste	one	Count:					
Element Type:			Total Quantity:					
Environment:	Moderate	e	Limited Insp'n:	Yes				
Protection System:		None						
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	%							
Comments:	Limited inspection due	to cover, howe	ver the structure	appears sta	ble.			
Recommended Work:	None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Structure: 19

Element Group:	Streams/Emban	kments	Length:						
Element Name:	Streams and Wa	terways	Width:						
Location:			Height:						
Material:			Count:						
Element Type:			Total Quantity:						
Environment:	Moderate		Limited Insp'n:						
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	%			100					
Comments:	Heavy vegetation of th	e stream em	bankments.						
Recommended Work: None 6-10 Years 1-5 Years < 1 Year									

### Element Data

Element Group:	Streams/Emban	kments	Length:					
Element Name:	Embankme	nt	Width:					
Location:	Each Corne	ər	Height:					
Material:			Count:		4			
Element Type:			Total Quantity:			4		
Environment:		Limited Insp'n:						
Protection System:			Non	ie				
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs	
	Each		4				Yes	
Comments:	Heavily vegetated with	minor signs	of erosion observ	/ed.				
Recommended Work	c None	6-10 Years	1-5 Years	< 1 Year	Urgent			

Element Group:	Signs		Length:						
Element Name:	Signs		Width:						
Location:	Each Corne	er	Height:						
Material:			Count:						
Element Type:			Total Quantity:			4			
Environment:	Severe		Limited Insp'n:						
Protection System:		None							
Condition Data:	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies	Maint. Needs		
	Each			4		Yes	Yes		
Comments:	Four (4) guiderail mark	er signs.							
Recommended Work: None 6-10 Years 1-5 Years < 1 Year									

Element Group:	Approache	es	Length:						
Element Name:	Wearing Sur	face	Width:						
Location:	Each End	t	Height:						
Material:	Asphalt		Count:						
Element Type:			Total Quantity:						
Environment:	Severe		Limited Insp'n:						
Protection System:		None							
	Units	Exc	Good	Fair	Poor	Perform.	Maint.		
Condition Data:	01110	L70.	0000	i an	1 001	Deficiencies	Needs		
	%			100					
Comments:	Mild to moderate alligation	tor cracking ol	bserved throughou	it.					
Recommended Work	: None	6-10 Years	1-5 Years	< 1 Year	Urgent				



Photo 19-2: View of culvert in elevation and inlet components



Photo 19-3: View of culvert in elevation and outlet components



Photo 19-4: View of culvert barrel interior



Photo 19-5: View of embankment



Photo 19-6: View of wearing surface



Photo 19-7: View of barrier protection



Photo 19-8: View of watercourse upstream



Photo 19-9: View of structure downstream