

### **MARINE DRIVE – PULP MILL BRIDGE**

#### **2024 BRIDGE INSPECTION**

February 8, 2024

Prepared For:



Prepared By:



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2218-B Airport Drive Campbell River, BC (778) 346-1818 stonecroftengineering.ca MARINE DRIVE – PORT ALICE PULP MILL BRIDGE

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## 1 BACKGROUND

On January 26, 2024, Brian Peeters, P.Eng of StoneCroft Engineering Ltd. (StoneCroft) completed a close proximity inspection of the Marine Drive Pulp Mill Bridge located in the town of Port Alice. The bridge has been termed "Pulp Mill Bridge" due to its proximity to the historic pulp mill. The bridge has been assumed to have been constructed in 1980 based on the bridge number cast in the headwall. The inspection was completed visually.

The bridge is a two lane, single span simply supported 30.5m long cast in place composite girder bridge with four girders complete with a concrete deck. The girders bear on pot bearings and concrete plinths. The abutments appear to be cast-in-place concrete on bedrock.

## 2 SUMMARY

The bridge overall is in good condition. Deck drains should be regularly checked and cleaned to prevent clogging during typical maintenance of brushing of approach barriers and cleaning of bearings.

The abutments appear stable with minimal scour potential due to the bedrock canyon. The return walls on the abutments are sufficient length to prevent erosion of granular banks entering the stream channel or being placed on the bridge bearings.

The coating on the steel girders has signs of flaking which has caused portions of the flanges and bearings to begin scaling. Red paint was noticed under the blue topcoat, which could be a sign of lead-based primer.

# **3 INSPECTION RESULTS**

#### 3.1 Approaches

The bridge approaches consist of asphalt lane ways and a concrete bridge deck. The structure does not appear to have approach slabs, which is leading to asphalt failure at the ends of the bridge deck. Expansion joints are not visible at the ends of the bridge and appear to have asphalt paved to the concrete deck. This asphalt at the concrete deck joint is deteriorating and breaking away. Asphalt patching compound should be added at the ends of the bridge to prevent spalling of the concrete deck.

The concrete approach barriers are well cleaned with the end noses painted yellow. The barriers are not connected to the bridge barriers for continuity.

Timber end posts for the W-beam barrier railing are rotten and should be replaced.



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#### 3.2 Deck

The bridge does not have an asphalt overlay, but the cast-in-place deck makes up the traveled surface and is in good condition. Deck drains are located throughout the structure on either side of the bridge adjacent to the elevated curb. At the time of inspection multiple deck drains were plugged with sediment, these drains partially cleaned during the inspection. Routine maintenance should be cleaning the deck drains and bearings.

On the downstream side of bridge, 3m from the south abutment exposed rebar was noted on the sofit of the cantilevered portion of the deck, this rebar has begun to corrode and spall concrete along the length of corrosion. This should be repaired to prevent further rebar corrosion and concrete spalling.

#### 3.3 Abutments

Both abutments consist of cast-in-place concrete on what appears to be intact bedrock. No signs of cracking or settlement were noted during the inspection. The bridge bears on pot bearings and concrete plinths, with an integrated concrete headwall. No lateral shear keys are present, the bearings are secured laterally with embedded steel dowels that are likely insufficient for seismic loading.

The bearing masonry and sole plates are poorly coated with exposed steel. The exposed steel is rusting and starting to flake of coating and steel material. These steel plates should be sufficiently cleaned, prepared, and re-coated to prevent bearing replacement or further corrosion.

### 3.4 Girders

The girders and bracing are generally in good condition. On average, it was estimated 95% of the coating is remaining, with surface staining and portions of the flanges starting to corrode. The bridge is currently 45 years old which has likely exceeded the expected service life of the coating. The type of coating system is unknown, but the rate of coating loss should be monitored.

# **4 RECOMMENDATIONS**

Table 1 – List of Maintenance / Repair Items				
Item No. Description Price				
1	Replace timber end posts for barrier railing	Moderate		
2	Clean deck and drains of sediments	Low		



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3	Installed standard MOTI delineators	Moderate
4	Repair asphalt and ends of bridge at concrete deck	Moderate
5	Clean and repair exposed rebar on underside of deck	Moderate
6	Clean, prepare and re-coat bearing plates	Low

Table 2 – List of Monitoring Items				
Item No.	Description	Priority		
1	Monitor coating loss	Low		

### 5 CLOSURE

We trust you will find this information meets your requirements. If you have any questions or concerns, please feel free to contact Brian Peeters at <u>brian@stonecroftengineering.ca</u> or phone (778)-346-1818 at your convenience.

Sincerely,

StoneCroft Engineering Ltd.



Brian Peeters, P.Eng Senior Bridge Engineer

Permit to Practice No. 1001856





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# **APPENDIX A: 2024 INSPECTION FORM**



	ROFT	Town of Port Alice Client				2218-B Airport Drive, Campbell River, BC, V9H 0E2 Phone: (778) 346-1818 Email: stonecroft@stonecroftenginegring ca				
Location: ° ' "N ° ' "W LEVEL 1 INSPECTION				peration DN - STEEL / C	ONCRETE BRIDGE	, o, o to 1010, Emain otom		Clear Form		
Road Name: Marine Drive Structure				ucture #:	Fabricated by: Unknown Fabricated Year: 1			Unknown		
Station Bridge				e Name: Pulp Mill	l bridge	, Installed by:	Unknown	Install Year:	1980	
Conceptual Design:	Unknow	'n		,	Serial Number:					
Structural Design:	Unknow	'n								
Construction Assur	ance on	File?								
Creek Descriptio	n:	Creek Name:			Approa	ches:				
Gradient:	<u></u> >25					Grades: Camp 2% Deck 2% Woods 2%				
Unstream width:			earance: >5	rance: >5		Description: Comment:				
Energy:	Modera	te	i otai ci		Alignmer	nt Horizontal:	Minor Corner			
Debris Load	Modera	te	Branches		Alignmor	at Vortical:	Uniform			
Sediment Load	Modera	te	Cobble		Surface		Good			
Seall Channel	Stable		Confined				Good			
	Podrock	/ Pouldors / Co	bblo		VISIDIIITY	; 				
Substrate:	Deurock				Approaci	n Fill:	Constantin No. Do da			
Stream Class:	Unknow	'n	Known	Assumed	Approac	h Barriers:		4/4		
Water User:					Delineat	ors:	Small	2/4		
Abutments skew:			0 °		Bridge Al	head:				
Creek Comments:				Add curre	ent delineators					
Deck:	Descript	ion		Condition	Girders	<u>:</u>				
Road Width:					Structure	e Type:	Steel Composite			
Running Width:	+/-7.0m	-7.0m			Overall L	ength:	30.45	# of Spans:	1	
Deck Type:	Concrete	ncrete			COB Spai	n:	# of Girder		4	
Bullrail Type:	W-Beam	3eam <b>Size</b>			Total Gir	der Height (o/o):	Girder Spacing		2.14	
Risers:	Steel Per		Per Side <sup>19</sup>		Top Flan	ge Width:	Tor	> Flange Thickness:		
Bolts Per Riser:	4	4			Web Hei	ght:		Web Thickness:	9.5	
Ties (w x h):	NA			1	Bottom F	lange Width:	410 Bott	tom Flange Thickness:	32	
Sub Deck:			Treated	1	Steel Coa	ating	Blue paint, red prime	er under		
Running Deck:	NA		Treated	1	Bolted Sr	nlice Plate	· · · · · · · · · · · · · · · · · · ·			
loints:	Asnhalt	hreaking at deck	(	Fair	Concrete	Girder Denth:	Glulom Lomination Thicknes			
Dota: Aspirat I			•		Concrete	Girder Width:	Glulam Lamination Widt		 	
Shear Connectors:	NΔ				Simply su	upported, no appro	ach slab. Deck overhangs abutment.		<u>i</u>	
Gravel Denth:	ΝΔ							0		
Abutment: North	Description:		Condition	Abutment: South Descripti		Description	Condit	tion		
Abutment Descript	ion·	CIP concrete o	n hedrock	condition.	Abutmer	t Description:	CIP concrete on bed	rock	1011.	
Girder Abut Conn	oction.	Pot boaring an		Good / Eair	Girdor A	hut Connection:	Pot boaring and dow	vols Good	/ Enir	
Abutmont Connect	ion.				Abutmor	t Connection:			1 011	
Conv	1011.				Con	it connection.				
Cap.		NA Concercto		Cood		/_ll.				
Ballast wall:	Concrete		Good	Ballast W	vaii:	Concrete	Good			
Kiprap:	NA Minu.		Carad	Kiprap:	£ 0	NA				
Quality of Construc	tion:		Good	Quality o	of Construction:		Good			
Overall Condition:				Good	Overall C	ondition:		Good		
Footing Founded O	n:	n: Bedrock		Good	Footing F	ounded On:	Bedrock Good			
Scour:	None			Scour:		None				
Indicators of Settle	e <b>ment:</b> None				Indicator	rs of Settlement:	None			
Encroaching:		No			Encroach	ning:	Νο			
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Summary of Comments					
Structural:	Priority Low				
No issues					
Structure appears to have inadequate transverse snear keys, likely susceptible to seismic.					
Environmental:	Priority Low				
Deck drains plugging at deck, sediment building up under bridge.					
Maintenance:	Priority Moderate				
Downstream deck has minor - moderate cracking on cantilever deck. 3m from south end has expos	sed bar and corroding				
Deck drains plugged at deck, opened up during inspection. Deck drains to be cleaned during regula	ar maintenance.				
Pot bearings in good condition, at plate edges and boilts paint peeiing and exposing red paint prime	ng scaling and applying paint.				
Treated timber posts at end of bridge connecting w-beam to bridge guard rails are rotten and some	e split, replace.				
Safety:	Priority Low				
Approach no barriers are not connected to bridge guard rails.					
General Comments:					
Inspected by: Brian Peeters	12.27 mm				
Inspected by: brian rectors Inspection Date: January 26, 2024 1	12:37 µm				
Current Load Rating:					
Next Inspection: Estimated Replacement Schedule:					
Design Load Rating:					
Previous Load Rating: Year					
Post Load Limit Sign: Reviewing F	Professional Engineer: Seal				

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01 - Approach from North Facing South



03 - Looking Upstream



02 - Approach from South Facing North



04 - Looking Downstream



05 - Profile from Downstream Looking Upstream



07 - Approach Barrier Connection



06 - Deck Drain, Typ.



08 - Bridge ID- 7662-80



08 - Deck Joint, Typ.



10 - Rebar Corrosion



09 - Rebar Corrosion



11 - Typical Bracing



12 - Typical Bearing Corrosion



13 - Typical Diaphragm



12 - Typical Bearing



14 - North Abutment



15 - South Abutment



16 - Typical Underside of Deck



17 - Rotten End Posts