

BRIDGE INSPECTION

BRIDGE NO. N2-068: Kootenay River
FSR (32.80 km)

Inspection Date: September 23, 2012

Inspected By: R. Veitch, M. Hanson

Year Built: 1961

Number of Spans: 5



Span Lengths:

Span 1 –	6,100 mm
Span 2 –	24,400 mm
Span 3 –	24,400 mm
Span 4 –	24,400 mm
Span 5 –	6,100 mm

Superstructure Type:

Spans 1 & 5 –	Sawn creosote treated stringers, 530 mm x 185 mm.
Spans 2, 3, 4 –	Glulam girders, 1500 mm x 275 mm spaced at 1335 mm c/c. Undertruss, 38 mm diameter Dywidag rods

Deck: Untreated timber deck planks, 300mm x 100mm.
Deck width 4,200 mm

Deck Structural: Transversely laminated creosote treated planks, 185 mm x 40 mm

Curb: Lower curb and risers are creosote treated. Upper curb and hand rail are untreated.

Substructure: Creosote treated timber posts/ piles and cast-in-place concrete.

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GENERAL BRIDGE CONDITION:

Superstructure Condition:	Fair
Substructure Condition:	Poor
Deck Condition:	Fair
Load Posting:	No sign noted.
Date for the Next Close Proximity Inspection:	2015
Projection for Replacement:	2017

BRIDGE INSPECTION SUMMARY/ RECOMMENDATIONS:

The bridge is generally in fair condition; however, we observed extensive decay and crushing of the Pier 1 cap beam. We also observed the commencement of decay in the Pier 4 cap beam. Given the extent of deterioration, we recommend that the Ministry replace the Pier 1 and 4 cap beams. In addition, the curb rail and pedestrian rail are in poor condition and require replacement.

INSPECTION NOTES:

Approaches:

- The approaches are generally in fair condition.
- Horizontal curves on both ends of the bridge and vegetation limit visibility coming on to the bridge.
- Camp end approach is rough.
- No approach fenders.

Deck:

- The deck is generally in fair condition.
- Over 30% of top curb rail is rotten.
- Handrail has missing/ damaged sections and construction is not consistent.

Abutments:

- The abutments are generally in fair condition.
- Cap beams are rotating slightly, not previously noted.
- Posts hammer sounded, no rot was found when drilled.

Piers:

- The piers are generally in fair condition except Pier 1 which is in poor condition.
- Pier 1 is in poor condition, rot observed above posts 3, 5 & 6 and crushing observed at post 6.
- Limited access to hammer sound posts because posts have timber sheathing.
- Cast-in-place concrete base in fair condition.
- Timber nose on Piers 2 and 3 is rotten.
- Minor debris accumulation and aggradation on Piers 2 and 3.
- 300 mm of end rot on Pier 4 cap beam, does not affect structure.

BRIDGE INSPECTION

Girders:

Typical Condition:

Spans 1 - 5 - Girder 1 upstream face:

- Fair condition
- Creosote leaching; girder faces 100% covered by creosote
- No checks observed
- Span 5, girder 1 is leaning outwards, likely a result of curb rail impact.

Spans 1 - 5 – Interior faces:

- Fair condition
- Creosote leaching; girder faces 100% covered by creosote
- No checks observed

Spans 1 - 5 – Girder 3 downstream face:

- Fair condition
- Creosote leaching; visible creosote on <25% of the girder faces (south facing)
- No checks observed

Checks on Girders:

- No existing or new checks were observed.

LIST OF MAINTENANCE ITEMS TO BE COMPLETED:

Items	Description	Priority
1.	Replace top section of curb rails and handrails.	High
2.	Replace Pier 1 cap beam.	High
3.	Replace timber nose on Piers 2 and 3.	Medium

MONITOR DURING FUTURE INSPECTIONS:

1. Monitor extent of rot in Pier 4 cap beam.
2. Monitor rotation of abutment cap beams.

BRIDGE INSPECTION

Prepared by:



Ryan Veitch, ASCT
Engineering Technologist

Reviewed by:



David Chen, P.Eng.
Project Manager

APR 24 2013

Attached:

1. CBR Report
2. Annotated Photo Sheets

BRIDGE INSPECTION

NOTES:

Directional & Numbering Conventions Used:

Girders and piles are numbered from upstream to downstream. Left end or right end is determined facing downstream (except for delineators). Spans and piers are numbered from the left end when facing downstream.

Projected Replacement Date:

The projected date for the bridge replacement is based on the remaining service life of the bridge. We estimate the remaining service life as the greater of:

For Glulam Girder Bridges:

1. Original design life, typically 50 years.
2. If a bridge is nearing the end of its estimated service life but is still in fair condition, we recommend that the Ministry assume a remaining service life of five years.

For Steel and Concrete Bridges:

1. Original design life, typically 60 years.
2. If a bridge is nearing the end of its estimated service life but is still in fair condition, we recommend that the Ministry assume a remaining service life of ten years.

Condition Ratings:

Excellent:	New or almost new condition and properly installed
Good:	Structurally sound, in good repair with minimal wear
Fair:	Structurally functional, shows moderate wear or preliminary indications of deterioration
Poor:	Structurally unsound, items typically in need of repair or replacement

Maintenance Priority (Typical Usage):

High:	Critical items that need to be addressed to protect safety of users (curbs, structural decks, delineators, major structural repairs, etc.); schedule work immediately.
Medium:	Items that maintain the service life of the bridge (wearing planks, deck joints, etc.)
Low:	Items that will extend the service life of the structure or general maintenance.

Cost Estimate:

The cost estimate for individual maintenance items, shown in the CBR report, reflects the cost of materials and labour for completing a task; it does not include any costs associated with mobilization, demobilization, engineering or contract administration.



BC Ministry of Forests and Range

Permanent Bridge Inspection Report

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Date Printed: 2013/03/28
User Id: BCEID\WRILEY1
Database: PROD
Report Id: CBR001A

Structure #:	N2-068	Site #:	N2-068	Road Name:	KOOTENAY RIVER	Inspection Date:	2012/09/23
KM:	33.01	User km:	32.80	Crossing Name:	KOOTENAY R	Next Inspection Date:	2015/09/23
Project File ID #:	0105	Br.	01	Forest District:	Rocky Mountain Forest District		
Deck Type:	Timber - Untreated			Running Surface:	Timber Planks		
Superstructure	Glulam Girder			Abutments (Left/Right):	Steel Pipe and Precast Pad		
Total Length (metres):	85.5	# Spans:	5	Span Length(s) (metres):	6.1, 24.4, 24.4, 24.4, 6.		
UTM Zone:	11	UTM Easting:	598225	UTM Northing:	5581300		
Inspector Name:	R. Veitch, M. Hanson			Year Built:	1961		
Access:							

ABUTMENTS

Bearings	Not Applicable	
Bracing	Good	
Ballast Wall	Good	
Corrosion Protection	Not Applicable	
Caps or Sills	Fair	Cap beams are rotating slightly, not previously noted.
Fill	Good	
Hardware	Good	
Piles or Posts	Fair	Posts hammer sounded, no rot was found when drilled.
Riprap	Good	
Wing Wall	Not Applicable	

APPROACHES

Alignment	Fair	Horizontal curves on both ends of the bridge and vegetation limit visibility coming on to the bridge.
Bridge Ahead Signs Missing	0	
Brushing Required	Yes	Both abutments should be brushed for snooper truck access.
Delineator Missing Left	0	
Delineator Missing Right	0	
Fender Condition	None	No fenders present.
Road Surface	Fair	Camp end approach is rough.

DECK

Span 1

Curb Rail/Blocks/Posts	Poor	Over 30% of the top curb rails are rotten.
Deck to Girder Bolts	Good	
Hardware	Good	



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Hand Rails/Walkouts	Poor	Handrail has missing/ damaged sections and construction is not consistent.					
Nails	Good						
Overall Deck Condition	Fair						
Running Planks	Good	Untreated timber planks.					
Sub Deck	Good	Transversely laminated timber planks. Creosote treated.					
Ties	Unrated	No ties.					
Span 2							
Curb Rail/Blocks/Posts	Poor	Over 30% of the top curb rails are rotten.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Poor	Handrail has missing/ damaged sections and construction is not consistent.					
Nails	Good						
Overall Deck Condition	Fair						
Running Planks	Good	Untreated timber planks.					
Sub Deck	Good	Transversely laminated timber planks. Creosote treated.					
Ties	Unrated	No ties.					
Span 3							
Curb Rail/Blocks/Posts	Poor	Over 30% of the top curb rails are rotten.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Poor	Handrail has missing/ damaged sections and construction is not consistent.					
Nails	Good						
Overall Deck Condition	Fair						
Running Planks	Good	Untreated timber planks.					
Sub Deck	Good	Transversely laminated timber planks. Creosote treated.					
Ties	Unrated	No ties.					
Span 4							
Curb Rail/Blocks/Posts	Poor	Over 30% of the top curb rails are rotten.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Poor	Handrail has missing/ damaged sections and construction is not consistent.					
Nails	Good						
Overall Deck Condition	Fair						
Running Planks	Good	Untreated timber planks.					
Sub Deck	Good	Transversely laminated timber planks. Creosote treated.					
Ties	Unrated	No ties.					



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DECK

Span 5

Curb Rail/Blocks/Posts	Poor	Over 30% of the top curb rails are rotten.
Deck to Girder Bolts	Good	
Hardware	Good	
Hand Rails/Walkouts	Poor	Handrail has missing/ damaged sections and construction is not consistent.
Nails	Good	
Overall Deck Condition	Fair	
Running Planks	Good	Untreated timber planks.
Sub Deck	Good	Transversely laminated timber planks. Creosote treated.
Ties	Unrated	No ties.

PIERS

Pier 1

Bearings	Not Applicable	
Bracing or Sheathing	Fair	
Caps	Poor	Rot observed above posts 3, 5 & 6 and crushing observed at post 6
Cribs	Not Applicable	
Dolphins	Not Applicable	
Hardware	Good	
Overall	Poor	Significant deterioration on cap beam.
Piles or Posts	Fair	
Riprap	Not Applicable	
Wall	Not Applicable	

Pier 2

Bearings	Not Applicable	
Bracing or Sheathing	Fair	
Caps	Fair	
Cribs	Not Applicable	
Dolphins	Not Applicable	
Hardware	Good	
Overall	Fair	Nosing on both ends of pier are rotten. Debris accumulation upstream.
Piles or Posts	Fair	
Riprap	Not Applicable	
Wall	Not Applicable	

Pier 3



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Bearings	Not Applicable						
Bracing or Sheathing	Fair						
Caps	Fair						
Cribs	Not Applicable						
Dolphins	Not Applicable						
Hardware	Good						
Overall	Fair	Nosing on both ends of pier are rotten.					
Piles or Posts	Fair						
Riprap	Not Applicable						
Wall	Not Applicable						
Pier 4							
Bearings	Not Applicable						
Bracing or Sheathing	Fair						
Caps	Fair	300 mm of end rot on Pier 4 cap beam, does not affect structure.					
Cribs	Not Applicable						
Dolphins	Not Applicable						
Hardware	Good						
Overall	Fair						
Piles or Posts	Fair						
Riprap	Not Applicable						
Wall	Not Applicable						
SUPERSTRUCTURE							
Span 1							
Bracing	Not Applicable						
Diaphragms	Unrated	No diaphragms.					
Girders	Fair	Refer to AE Inspection Summary 2012					
Hardware	Good						
Under Trussing	Not Applicable						
Span 2							
Bracing	Fair						
Diaphragms	Fair						
Girders	Fair	Refer to AE Inspection Summary 2012					
Hardware	Good						
Under Trussing	Fair						
Span 3							
Bracing	Fair						
Corporate Bridge Register (CBR)							



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Diaphragms	Fair									
Girders	Fair	Refer to AE Inspection Summary 2012								
Hardware	Good									
Under Trussing	Fair									
Span 4										
Bracing	Fair									
Diaphragms	Fair									
Girders	Fair	Refer to AE Inspection Summary 2012								
Hardware	Good									
Under Trussing	Fair									
Span 5										
Bracing	Not Applicable									
Diaphragms	Unrated	No diaphragms.								
Girders	Fair	Refer to AE Inspection Summary 2012								
Hardware	Good									
Under Trussing	Not Applicable									
CHANNEL	Estimated Present Water Level Depth:					Estimated Present Water Level Width:				
	Estimated High Water Level Clearance:		6.0							
HAZARDS	High Water:	No	Scour:	Yes	Ice:	No	Debris:	Yes	Aggradation:	Yes
	Comment:	Debris accumulating and minor aggradation at piers 2 and 3								
REPAIRS	#	Status	Priority	Estimate	Description					
	1	Recommended	High	\$10,000.00	Replace top section of curb rails and handrails.					
	2	Recommended	High	\$20,000.00	Replace pier 1 cap beam.					
	3	Recommended	Medium	\$2,500.00	Replace timber nose on Piers 2 and 3.					
MONITORS	#	Description								
	1	Monitor extent of rot on Pier 4 cap beam.								
GENERAL	Professional Inspection Required?		No	Regional Review Date:		2013/03/27	P. Eng Reviewer Name:		Barry Trenholm	
	Replacement Date for full log haul traffic (year):			2015		Replacement Date for light vehicle traffic (year):			2018	
	Current Load Rating GVW (tonnes):		90		Design Load GVW (tonnes):		90		Design Vehicle Config.: L100	
	Inspector's Estimated Full Log Haul Replacement (year):				2017					
Corporate Bridge Register (CBR)										



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	Inspector's Comment:	The bridge is generally in fair condition; however, we observed extensive decay and crushing of the Pier 1 cap beam. We also observed the commencement of decay in the Pier 4 cap beam. Given the extent of deterioration, we recommend that the Ministry replace the Pier 1 and 4 cap beams. In addition, the curb rail and pedestrian rail are in poor condition and require replacement.					
	PEng Reviewer's Comment:	Accepted LT. Put a plan in place to address the rotting caps.					
	District Staff Comment:						

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
N2-068	Kootenay R	Kootenay River	32.80	33.0		



Figure 1-1: Upstream elevation.



Figure 1-2: Downstream elevation.



Figure 1-3: Looking upstream.

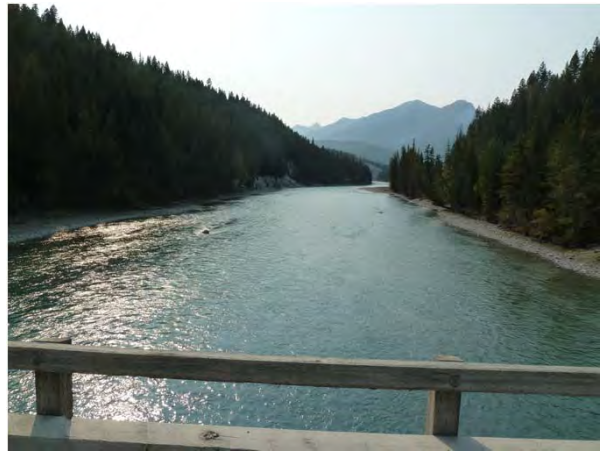


Figure 1-4: Looking downstream.

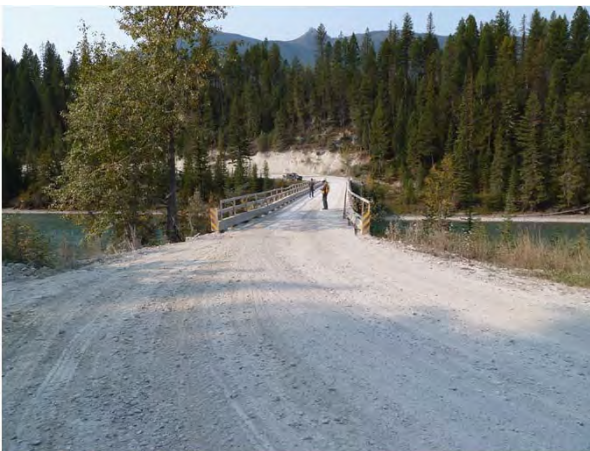


Figure 1-5: Looking towards camp end.



Figure 1-6: Bridge deck looking towards camp end.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
N2-068	Kootenay R	Kootenay River	32.80	33.0		



Figure 1-7: Guardrail rot.



Figure 1-8: Typical deck condition.



Figure 1-9: Damaged railing post.

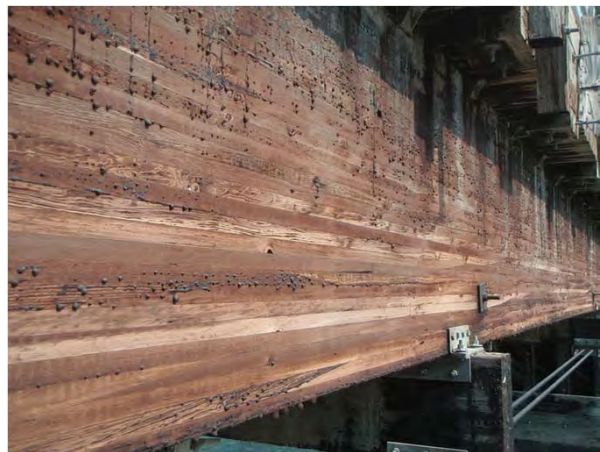


Figure 1-10: Downstream face of girder.



Figure 1-11: Upstream face of girders.

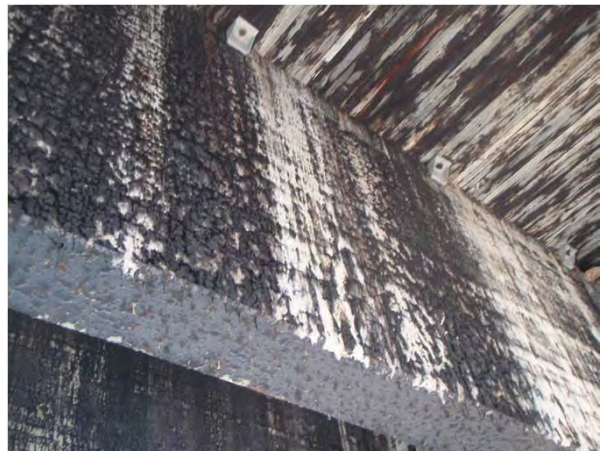


Figure 1-12: Typical interior face of girders.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
N2-068	Kootenay R	Kootenay River	32.80	33.0		



Figure 1-13: Camp end abutment.



Figure 1-14: Camp end cap beam.



Figure 1-15: Downstream pier 1 post.



Figure 1-16: Typical dywidag bars.



Figure 1-17: Pier 1 from camp end.



Figure 1-18: Pier 1 cap crushing at upstream column.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
N2-068	Kootenay R	Kootenay River	32.80	33.0		



Figure 1-19: Pier 2 from camp end.



Figure 1-20: Pier 3 nose.

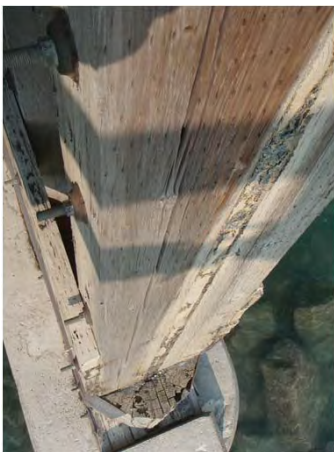


Figure 1-21: Vertical check on pier 2 downstream pile.



Figure 1-22: Pier 3 from camp end.



Figure 1-23: Woods end abutment.



Figure 1-24: Span 5, girder 1 leaning outwards.