

BRIDGE INSPECTION

BRIDGE NO./NAME **N2-103: Kootenay By-Pass (9.50 km)**

Inspection Date: September 23rd, 2012

Inspected By: M. Hanson, R. Veitch

Year Built: 1982

Number of Spans: 4



Span Lengths: Spans 1 & 4 – 24,327 mm

Spans 2 & 4 – 24,371 mm

Superstructure Type: All spans – Two simply supported glulam slab girders, 1820 mm x 410 mm, spaced at 3000 mm o/c.

Deck: 1 layer of untreated timber running planks, 254 mm x 89 mm.

Deck Structural: Creosote treated deck planks, 254 mm x 89 mm with 200 mm x 300 mm ties spaced at 420 mm o/c.

Curb: Untreated timber curb and risers with timber handrails.

Substructure:

Abutments:	Steel H-Piles, concrete caps, creosote treated ballast walls.
Piers:	Three steel pipe piles with steel plate diaphragms, concrete cap.

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GENERAL BRIDGE CONDITION:

Superstructure Condition:	Fair
Substructure Condition:	Fair
Deck Condition:	Fair
Load Posting:	No sign noted.
Date for the Next Close Proximity Inspection:	2015
Projected Replacement Date:	2032

BRIDGE INSPECTION SUMMARY/ RECOMMENDATIONS:

The bridge is generally in fair condition. The steel pedestrian rail installed along the length of the bridge is damaged and loose in a number of places. If the Ministry believes that this rail is necessary, they should make the required repairs otherwise, the rail can be left in place since it does not affect vehicle containment and delineates the deck edge.

INSPECTION NOTES:

Approaches:

- The approaches are generally in fair condition.
- Limited visibility on the left end approach due to a moderately tight horizontal curve and overgrown vegetation.
- All delineators and bridge ahead signs are present.
- The timber fender on the left end approach is heavily rotten and is no longer functional.

Deck:

- The deck is generally in fair condition.
- Minimal wear on running planks.
- Debris is accumulating along the sub deck planks between the running planks.
- Checks noted along most of the curb rails; curbs were sounded, no rot noted.
- Multiple sections of damaged, loose or missing hand rails.

Abutments:

- The left end abutment is generally in fair condition.
- Minor hairline cracking noted on the concrete cap above the tiebacks and between the middle piles.
- A minimal amount of rip-rap is placed around the abutment, no signs of erosion noted.
- The right end abutment is generally in fair condition.
- A minimal amount of rip-rap is placed around the abutment, no signs of erosion noted.

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Piers:

- Pier 1 is generally in good condition.
- One small section of delamination (0.5 ft²) on the right end of the cap, not previously noted.
- Pier 2 is generally in good condition.
- No defects or deterioration noted.
- Pier 3 is generally in good condition.
- Debris is accumulating on top of concrete cap.

Girders:

Typical Condition:

All spans - Girder 1 upstream face:

- Minimal creosote leaching out of girder face at laminate joints.
- Minor weathering, few checks noted, typically <20 mm deep. Similar to previous inspections.

All spans - Girder 1 downstream face and Girder 2 upstream face:

- Minimal creosote leaching out of girder face at laminate joints.
- No weathering.

All spans - Girder 2 downstream face:

- Creosote leaching out, 75% of girder face exposed.
- Moderate weathering, numerous checks noted; similar to previous inspections.

Checks on Girders:

Span 1 – Girder 2 downstream face:

Tag Type	Check Start	Check End	Length (mm)	Max. Depth (mm)	Max. Width (mm)	Location (mm)	Condition
Existing		AE 1268	-	60	-	1200 mm from top of girder	Has not propagated. AE tag replaces existing nail/ flag marker.
Existing	Pier 1	AE 892	6000	40	-	150 mm from top of girder	Has not propagated.

Span 3 – Girder 2 downstream face:

Tag Type	Check Start	Check End	Length (mm)	Max. Depth (mm)	Max. Width (mm)	Location (mm)	Condition
Existing	Pier 2	AE 158	4000	40	-	1200 mm from top of girder	Has not propagated.

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Span 4 – Girder 2 downstream face:

Tag Type	Check Start	Check End	Length (mm)	Max. Depth (mm)	Max. Width (mm)	Location (mm)	Condition
Existing	Camp end abut.	AE 25	4000	40	-	1000 mm from top of girder	Has not propagated.
New	Camp end abut.	AE 1272	14,500	70	-	450 mm from top of girder	Check propagated 2500 mm from AE 937.
Existing	-	AE 685	-	60	-	1000 mm from top of girder	Possible extension of AE 25. Cored below check, no rot noted.
Existing	Camp end abut.	AE 937	9000	70	-	450 mm from	Has not propagated.

LIST OF MAINTENANCE ITEMS TO BE COMPLETED:

Items	Description	Priority
1.	Replace approach timber fenders.	High
2.	Replace 40 m of damaged/ missing/ loose hand rails.	Medium
3.	Brush along approaches and around abutments.	Low

MONITOR DURING FUTURE INSPECTIONS:

- None

Prepared by:



Mike Hanson, EIT.
Project Engineer

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

Page 1 of 5
Date Printed: 2013/03/25
User Id: BCEID\WRILEY1
Database: PROD
Report Id: CBR001A

Structure #:	N2-103	Site #:	N2-103	Road Name:	KOOTENAY-BY PASS	Inspection Date:	2012/09/23
KM:	0.08	User km:	9.50	Crossing Name:	KOOTENAY R	Next Inspection Date:	2012/08/02
Project File ID #:	0105	Br.	02	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):	97.3	# Spans:	4	Span Length(s) (metres):	24.3, 24.3, 24.3, 24.3		
UTM Zone:	11	UTM Easting:	591312	UTM Northing:	5561620		
Inspector Name:	R. Veitch, M. Hanson			Year Built:	1982		
Access:							

ABUTMENTS

Bearings	Good	
Bracing	Good	
Ballast Wall	Fair	
Corrosion Protection	Not Applicable	
Caps or Sills	Fair	Minor hairline cracking noted on the left end concrete cap above the tiebacks and between the middle piles.
Fill	Good	
Hardware	Good	
Piles or Posts	Good	
Riprap	Fair	Minimal amount of riprap is placed around both abutments, no signs of erosion noted.
Wing Wall	Not Applicable	

APPROACHES

Alignment	Fair	Limited visibility on the left end approach due to a moderately tight horizontal curve and overgrown vegetation.
Bridge Ahead Signs Missing	0	
Brushing Required	Yes	Vegetation on left end approach overgrown.
Delineator Missing Left	0	
Delineator Missing Right	0	
Fender Condition	Poor	The timber fender on the left end approach is heavily rotten and is no longer functional.
Road Surface	Good	

DECK

Span 1

Curb Rail/Blocks/Posts	Fair	Checks noted along most of the curb rails; curbs were sounded, no rot noted.
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Structure #:	N2-103	Site #:	N2-103	Road Name:	KOOTENAY-BY PASS	Inspection Date:	2012/09/23
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Poor	Sections of damaged, loose or missing hand rail.					
Nails	Good						
Overall Deck Condition	Fair						
Running Planks	Fair	Minimal wear on running planks.					
Sub Deck	Fair	Debris is accumulating along the sub deck planks between the running planks.					
Ties	Good						
Span 2							
Curb Rail/Blocks/Posts	Fair	Checks noted along most of the curb rails; curbs were sounded, no rot noted.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Poor	Sections of damaged, loose or missing hand rail.					
Nails	Good						
Overall Deck Condition	Fair						
Running Planks	Fair	Minimal wear on running planks.					
Sub Deck	Fair	Debris is accumulating along the sub deck planks between the running planks.					
Ties	Good						
Span 3							
Curb Rail/Blocks/Posts	Fair	Checks noted along most of the curb rails; curbs were sounded, no rot noted.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Poor	Sections of damaged, loose or missing hand rail.					
Nails	Good						
Overall Deck Condition	Fair						
Running Planks	Fair	Minimal wear on running planks.					
Sub Deck	Fair	Debris is accumulating along the sub deck planks between the running planks.					
Ties	Good						
Span 4							
Curb Rail/Blocks/Posts	Fair	Checks noted along most of the curb rails; curbs were sounded, no rot noted.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Poor	Sections of damaged, loose or missing hand rail.					
Nails	Good						
Overall Deck Condition	Fair						
Running Planks	Fair	Minimal wear on running planks.					



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DECK

Sub Deck	Fair	Debris is accumulating along the sub deck planks between the running planks.
Ties	Good	

PIERS

Pier 1

Bearings	Good	
Bracing or Sheathing	Good	
Caps	Good	One small section of delamination (0.5 ft2) on the right end of the cap, not previously noted.
Cribs	Not Applicable	
Dolphins	Not Applicable	
Hardware	Not Applicable	
Overall	Good	
Piles or Posts	Good	
Riprap	Not Applicable	
Wall	Not Applicable	

Pier 2

Bearings	Good	
Bracing or Sheathing	Good	
Caps	Good	
Cribs	Not Applicable	
Dolphins	Not Applicable	
Hardware	Not Applicable	
Overall	Good	
Piles or Posts	Good	
Riprap	Not Applicable	
Wall	Not Applicable	

Pier 3

Bearings	Good	
Bracing or Sheathing	Good	
Caps	Good	Debris is accumulating on top of concrete cap.
Cribs	Not Applicable	
Dolphins	Not Applicable	
Hardware	Not Applicable	
Overall	Good	



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Piles or Posts	Good	
Riprap	Not Applicable	
Wall	Not Applicable	

SUPERSTRUCTURE

Span 1

Bracing	Good	
Diaphragms	Good	
Girders	Fair	Refer to AE Inspection Summary 2012.
Hardware	Good	
Under Trussing	Not Applicable	

Span 2

Bracing	Not Applicable	
Diaphragms	Good	
Girders	Fair	Refer to AE Inspection Summary 2012.
Hardware	Good	
Under Trussing	Not Applicable	

Span 3

Bracing	Not Applicable	
Diaphragms	Good	
Girders	Fair	Refer to AE Inspection Summary 2012.
Hardware	Good	
Under Trussing	Not Applicable	

Span 4

Bracing	Not Applicable	
Diaphragms	Good	
Girders	Fair	Refer to AE Inspection Summary 2012.
Hardware	Good	
Under Trussing	Not Applicable	

CHANNEL	Estimated Present Water Level Depth:	2.0	Estimated Present Water Level Width:	72.0
	Estimated High Water Level Clearance:	2.9		

HAZARDS	High Water:	No	Scour:	No	Ice:	No	Debris:	Yes	Aggradation:	No
	Comment:	Minor debris accumulating on pier 3.								



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Structure #:	N2-103	Site #:	N2-103	Road Name:	KOOTENAY-BY PASS	Inspection Date:	2012/09/23
REPAIRS	#	Status	Priority	Estimate	Description		
	1	Recommended	High	\$3,000.00	Replace approach timber fender		
	2	Recommended	Medium	\$2,000.00	Replace 40 m of damaged/ missing/ loose hand rails		
	3	Recommended	Low	\$300.00	Brush along approaches and around abutments.		
MONITORS	#	Description					
GENERAL	Professional Inspection Required?		No	Regional Review Date:		P. Eng Reviewer Name:	
	Replacement Date for full log haul traffic (year):			2032	Replacement Date for light vehicle traffic (year):		2032
	Current Load Rating GVW (tonnes):		91	Design Load GVW (tonnes):		91	Design Vehicle Config.:
	Inspector's Estimated Full Log Haul Replacement (year):			2032			
	Inspector's Comment:	The bridge is generally in fair condition. The steel pedestrian rail installed along the length of the bridge is damaged and loose in a number of places. If the Ministry believes that this rail is necessary, they should make the required repairs otherwise, the rail can be left in place since it does not affect vehicle containment and delineates the deck edge.					
	PEng Reviewer's Comment:						
	District Staff Comment:						

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
N2-103	Kootenay R	Kootenay-By Pass	9.50	0.08		



Figure 1-1: Upstream elevation.



Figure 1-2: Downstream elevation.

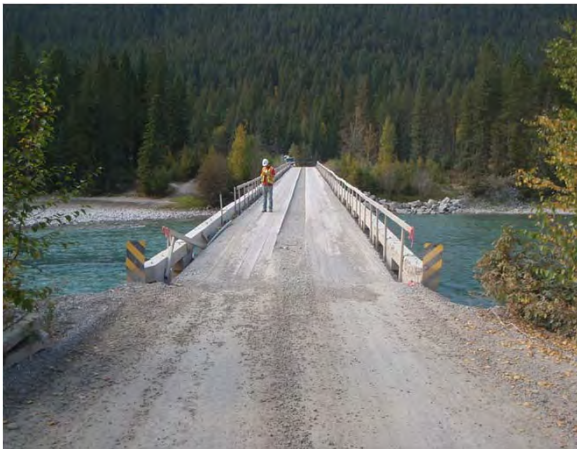


Figure 1-3: Looking towards left end.



Figure 1-4: Looking towards right end.

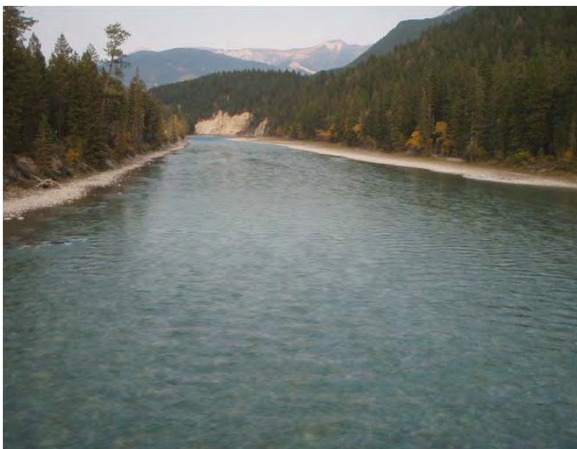


Figure 1-5: Looking upstream.

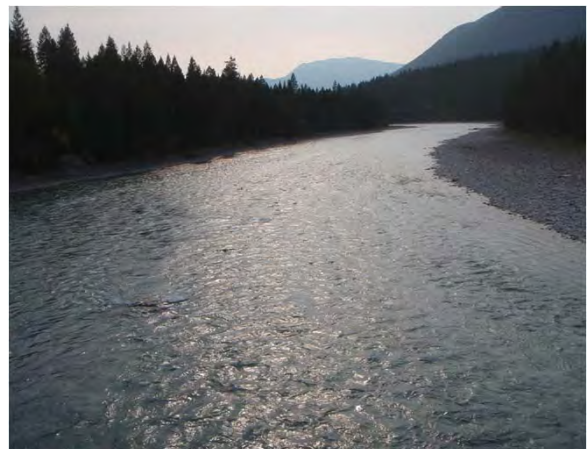


Figure 1-6: Looking downstream.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
N2-103	Kootenay R	Kootenay-By Pass	9.50	0.08		



Figure 1-7: Left end approach, note condition of fender and overgrown vegetation.



Figure 1-8: Typical curb rail condition.

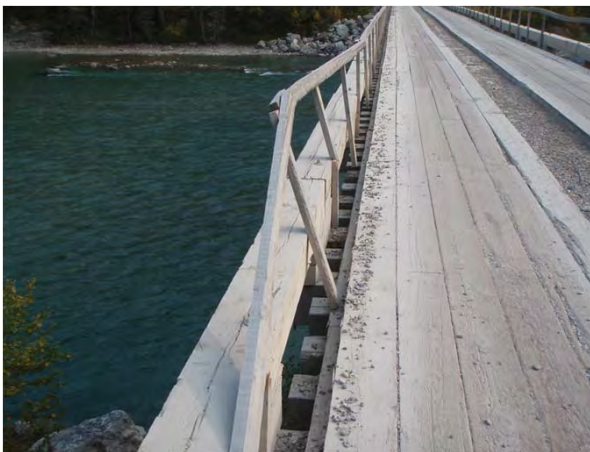


Figure 1-9: Damaged handrail.

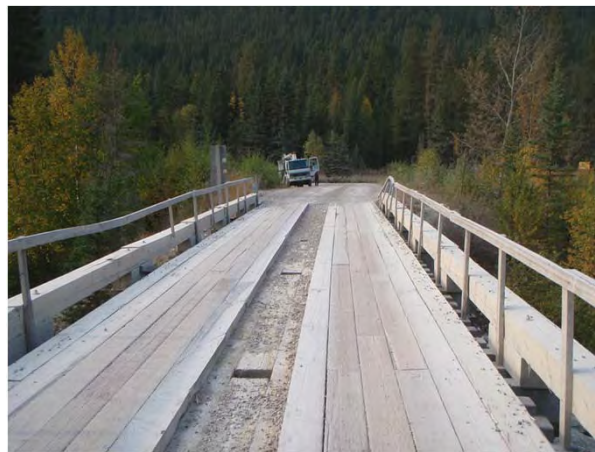


Figure 1-10: Wearing surface.



Figure 1-11: Typical interior face of girders.



Figure 1-12: Downstream face of span 4 - girder 2.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
N2-103	Kootenay R	Kootenay-By Pass	9.50	0.08		



Figure 1-13: Right end abutment.



Figure 1-14: Left end abutment.



Figure 1-15: Left end abutment piles.



Figure 1-16: Left end downstream bearing.



Figure 1-17: Left end ballast wall upstream.



Figure 1-18: Pier 1 cap delamination.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
N2-103	Kootenay R	Kootenay-By Pass	9.50	0.08		



Figure 1-19: Pier 2 from left end.



Figure 1-20: Pier 3 from left end.